

**BEFORE THE  
PUBLIC SERVICE COMMISSION OF  
SOUTH CAROLINA**

**DOCKET NO. 2020-\_\_-E**

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IN RE: )  
)  
Duke Energy Carolinas, LLC's )  
Establishment of Solar Choice Metering )  
Tariffs Pursuant to S.C. Code Ann. Section )  
58-40-20 )  
)  
Duke Energy Progress, LLC's )  
Establishment of Solar Choice Metering )  
Tariffs Pursuant to S.C. Code Ann. Section )  
58-40-20 )

**DIRECT TESTIMONY OF  
LEIGH C. FORD FOR DUKE  
ENERGY CAROLINAS, LLC AND  
DUKE ENERGY PROGRESS, LLC**

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**I. INTRODUCTION AND SUMMARY**

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is Leigh C. Ford, and my business address is 1201 Main Street, Suite 1180, Columbia, South Carolina 29201.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

A. I have been engaged by Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC (“DEP” and together with DEC, the “Companies”) as a consultant and I support the Companies’ regulatory and legal teams in the implementation of S.C. Act No. 62 of 2019’s (“Act 62”) new net energy metering (“NEM”) requirements.

**Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.**

A. I received a Bachelor’s Degree in Communications from Lenoir-Rhyne University in 2002. I joined the South Carolina Office of Regulatory Staff (“ORS”) in 2007 and served in a variety of positions, including a Rates and Regulatory Analyst, Manager of Electric Regulation, and as the Deputy Director for Electric and Natural Gas Regulation, through 2016. Prior to joining ORS, I was a Field Service Representative with the South Carolina Budget and Control Board. From 2016 – 2017, I was the Director of Strategy and Continuous Improvement for the South Carolina Department of Health and Environmental Control. From 2017 – 2019, I was employed by Proactive MD, first as the National Director for Operational Strategy and Processes and then as an Associate Vice President for Marketing and

1 Communications. I have served in my current role with the Companies since  
2 August 2019.

3 **Q. HAVE YOU TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION**  
4 **OF SOUTH CAROLINA (THE “COMMISSION”) IN ANY PRIOR**  
5 **PROCEEDINGS?**

6 A. Yes, I have testified before the Commission on numerous occasions on behalf of  
7 ORS, including rate cases involving DEC, South Carolina Electric & Gas Company  
8 (“SCE&G”), and Lockhart Power Company, and annual fuel reviews for DEC,  
9 DEP, and SCE&G. While at ORS I also testified in Act 236-related proceedings,  
10 including the NEM value of solar methodology and the investor owned utilities’  
11 applications to develop Distributed Energy Resource (“DER”) Programs. I also  
12 presented on behalf of ORS in an allowable ex-parte briefing regarding renewable  
13 resources and their role in South Carolina’s electric generation portfolio. In my  
14 current role I will also provide testimony to the Commission in the upcoming  
15 hearing<sup>1</sup> in Docket No. 2019-182-E (the “Generic Docket”), which is the generic  
16 docket established by the Commission in which the Companies presented an  
17 evaluation of the current NEM programs established under Act 236 (the “Existing  
18 NEM Programs”).

19 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

20 A. The purpose of my testimony is to provide the Commission with a summary of the  
21 Companies’ stakeholder engagement process, including stakeholder input, and how

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<sup>1</sup> The hearing in the Generic Docket is scheduled to begin on November 17, 2020.

1           this process impacted the Companies' development of the proposed solar choice  
2           metering riders and rate schedules (collectively, the "Solar Choice Tariffs").

3   **Q.    ARE YOU INCLUDING ANY EXHIBITS IN SUPPORT OF YOUR**  
4   **TESTIMONY?**

5   A.    Yes. My testimony includes three exhibits: **Ford Direct Exhibit 1**, which is a copy  
6           of the agenda, meeting minutes, and presentations for the March 12, 2020,  
7           stakeholder meeting; **Ford Direct Exhibit 2**, which is a copy of the agenda,  
8           meeting minutes, and presentations for the April 24, 2020, stakeholder meeting;  
9           and **Ford Direct Exhibit 3**, which is a copy of a filing made by the Companies  
10          with the Commission on September 21, 2020, and **Ford Direct Exhibit 4**, which  
11          is a copy of the agenda, meeting minutes, and presentations for the September 23,  
12          2020, stakeholder meeting.

13 **Q.    WERE FORD DIRECT EXHIBITS 1, 2, 3, AND 4 PREPARED BY YOU OR**  
14 **UNDER YOUR SUPERVISION OR OTHERWISE PUBLICLY**  
15 **AVAILABLE?**

16 A.    Yes, they were.

17 **Q.    PLEASE PROVIDE A SUMMARY OF YOUR DIRECT TESTIMONY.**

18 A.    Act 62 requires the Companies to develop and propose for Commission approval  
19          the Solar Choice Riders and Tariffs, which will serve as the basis for NEM under  
20          Act 62 (the "Solar Choice Program"). Although the Solar Choice Program will  
21          build upon the success of the Existing NEM Programs, Act 62 contains new  
22          requirements for the Solar Choice Program that simply were not in Act 236 and  
23          thus not reflected in the Existing NEM Programs. These new requirements include



provisions related to eliminating cost-shift and subsidization “to the greatest extent practicable,”<sup>2</sup> and developing a methodology, while accounting for things like billing capabilities and measurement intervals.<sup>3</sup> As such, the Companies engaged in a stakeholder process spanning several months in which the Companies’ presented information—such as cost of service implications under Existing NEM Programs and future planning strategies—in order to solicit meaningful feedback from stakeholders that could be utilized to ensure the Companies’ Solar Choice Riders and Tariffs not only comply with Act 62, but also are supported by industry participants and clean-energy advocates. Ultimately, this stakeholder engagement process resulted in the execution of a Stipulation that will be filed simultaneously herewith. The Stipulation represents the mutually agreed to terms and conditions of the Companies’ proposed Solar Choice Program—all supported by the parties to the Stipulation. As such, the Companies are proud to present the Commission with Solar Choice Riders and Tariffs that were developed via a collaborative stakeholder process to achieve the key principles within Act 62.

## II. REQUIREMENTS OF ACT 62

### **Q. WHY ARE THE COMPANIES PROPOSING NEW NEM TARIFFS?**

A. Act 62—which was signed into law by Governor Henry McMaster—requires the Commission to establish a new generation of NEM in South Carolina. Act 62 mandates that the Commission must approve tariffs under the Solar Choice

<sup>2</sup> S.C. Code Ann. § 58-40-20(A)(3).

<sup>3</sup> S.C. Code Ann. § 58-40-20(F)(3).

Program that go into effect no later than June 1, 2021,<sup>4</sup> and the Companies are submitting the proposed Solar Choice Riders and Tariffs simultaneously herewith in accordance with Commission Order No. 2020-621.<sup>5</sup>

**Q. PLEASE PROVIDE A BRIEF OVERVIEW OF ACT 62'S REQUIREMENTS AS THEY RELATE TO THE SOLAR CHOICE PROGRAM.**

A. The overarching principle within Act 62 as it relates to the Solar Choice Program is that the programs should “allocate costs and benefits to eliminate any cost shift or subsidization associated with net metering to the greatest extent practicable.”<sup>6</sup> This is a new requirement within Act 62, and will require the Companies to implement a different rate structure than in the Existing NEM Programs given that the Companies analysis in the Generic Docket indicated that certain cost-shift and subsidies are borne by non-NEM customers under the Existing NEM Programs. To achieve this goal, Act 62 requires the Solar Choice Riders and Tariffs to include “a methodology to compensate customer-generators for the benefits provided by their generation to the power system,” and directs the Commission to consider the following factors when selecting an appropriate billing mechanism and energy measurement for the Solar Choice Tariffs:

<sup>4</sup> However, customers applying for NEM after the effective date of Act 62, but before June 1, 2021, may continue to participate in the Existing NEM Programs until May 31, 2029.

<sup>5</sup> Commission Order No. 2020-621 established the procedural deadlines for the Commission’s consideration of the Solar Choice Tariffs. Although that order was issued in Docket Nos. 2019-169-E and 2019-170-E, the Commission Directive issued in those dockets on October 28, 2020, directed the Clerk’s office to establish two new dockets—one for DEC and once for DEP—in which the Commission would consider the Solar Choice Tariffs.

<sup>6</sup> S.C. Code Ann. § 58-40-20(A)(3).

- 1 (a) current metering capability and the cost of upgrading  
 2 hardware and billing systems to accomplish the provisions  
 3 of the tariff;  
 4 (b) the interaction of the tariff with time-variant rate  
 5 schedules available to customer-generators and whether  
 6 different measurement intervals are justified for customer-  
 7 generators taking service on a time-variant rate schedule;  
 8 (c) whether additional mitigation measures are warranted to  
 9 transition existing customer-generators; and  
 10 (d) any other information the commission deems relevant.<sup>7</sup>  
 11

12 As described in greater detail by the Companies' Witness Huber, there are  
 13 also certain generally applicable principles within Act 62 that the Companies  
 14 leveraged within the Solar Choice Tariffs, such as consideration of time variant  
 15 pricing and aligning rates with the costs of service.<sup>8</sup> The Companies focused upon  
 16 the above mandates and principles in collaborating with stakeholders to ensure that  
 17 the Solar Choice Riders and Tariffs embody the next generation of NEM envisioned  
 18 by Act 62.

### 19 **III. STAKEHOLDER ENGAGEMENT**

20 **Q. PLEASE EXPLAIN THE STAKEHOLDER ENGAGEMENT PROCESS IN**  
 21 **WHICH THE COMPANIES ENGAGED TO DEVELOP THE SOLAR**  
 22 **CHOICE TARIFFS.**

23 A. The Companies greatly appreciate stakeholder input and recognize that  
 24 collaboration can lead to comprehensive solutions and positive outcomes for all  
 25 parties, and the Companies believe this process was particularly successful given  
 26 that it resulted in a Stipulation representing the comprehensive proposal supported

<sup>7</sup> S.C. Code Ann. § 58-40-20(F)(3)(A).

<sup>8</sup> S.C. Code Ann. § 58-40-20(F)(3)(B); S.C. Code Ann. § 58-27-845(D).

1 by the Companies and various industry participants and clean-energy advocates.  
2 With this perspective and in the spirit of Act 62 —as well as requests from multiple  
3 stakeholders for stakeholder engagement and workshops which were publicly filed  
4 at various times with the Commission—the Companies organized two initial  
5 stakeholder workshops to encourage stakeholder participation and solicit feedback  
6 regarding the implementation of Act 62, cost benefit methodologies, best practices  
7 from around the county, and options for future NEM programs in South Carolina.  
8 The Companies initially reached out via phone and email to various stakeholders  
9 who have been involved in DEC or DEP’s other stakeholder engagement efforts to  
10 explain the goals of the upcoming workshops and to invite them to join the meetings  
11 and invite other interested stakeholders. During the first stakeholder workshop, on  
12 behalf of the Companies, I asked the participants to share with me the names of  
13 any people or groups that should be invited to future stakeholder meetings.  
14 Throughout the stakeholder process, the Companies made public filings with the  
15 Commission to keep the Commission and the public apprised of the workshops.  
16 The Companies made a good-faith effort to include all interested stakeholders in  
17 this process. The Companies appreciate the participation and input from all  
18 stakeholders.

19 The first stakeholder workshop was held on Thursday, March 12, 2020 with  
20 42 participants. On Thursday, April 23, 2020, the Companies held another  
21 stakeholder workshop, which had 47 participants in attendance.

22 Subsequent to these workshops, the Companies collaborated in good-faith  
23 with numerous stakeholders who advocated a desire to develop a common set of

1 terms to (i) advance the next generation of NEM under Act 62, (ii) provide  
2 customers an opportunity to manage demand and reduce strain on the power grid,  
3 and (iii) ensure an advanced energy future in the Companies' service territories.  
4 The feedback and discussions arising from the workshops and subsequent  
5 discussions are the foundation upon which the Stipulation is based.

6 **Q. WHAT WAS THE FORMAT OF THE WORKSHOPS?**

7 A. The March 12, 2020 workshop was held in person in Columbia, South Carolina  
8 with an option for participants to attend remotely via GlobalMeet. While originally  
9 planned as an in-person event, the April 23, 2020 workshop was held remotely  
10 using GlobalMeet due to the COVID-19 pandemic.

11 **Q. WHAT INFORMATION WAS PRESENTED AT THE WORKSHOPS?**

12 A. **Ford Direct Exhibit 1** and **Ford Direct Exhibit 2** contain the information that was  
13 presented at the workshops, and the information presented related to numerous  
14 topics of interest to the stakeholders. On March 12, 2020, the Companies presented  
15 an overview of Act 62 as it relates to NEM and gave presentations on long-run  
16 marginal costs, cost of service implications of customer generators, and the  
17 Companies' future strategies regarding transmission and distribution planning. A  
18 presentation on cost of service implications of customer generators was also given  
19 by a representative from Vote Solar.

20 At the April 23 workshop, the Companies gave presentations on the value  
21 of DER according to the Act 236 methodology, options for successor tariffs and  
22 rate design based on examples from other states, and options for an Act 62  
23 compliant tariff. A presentation on potential considerations when evaluating the

1 direct and indirect economic impacts of NEM in South Carolina was also given by  
2 a representative from Sunrun, Inc.

3 **Q. WHAT TYPE OF FEEDBACK DID THE COMPANIES REQUEST FROM**  
4 **THE WORKSHOP PARTICIPANTS?**

5 A. The Companies requested feedback from participants regarding the cost-benefit  
6 framework under Act 62, methods for determining the direct and indirect economic  
7 impacts to the State, ideas regarding integrated cost of service both in the near-term  
8 and long-term, the valuation of DER data, the impact of time variability on the  
9 value of solar, long run marginal costs, the definition of “local” under Act 62, and  
10 best practices from other jurisdictions.

11 **Q. GENERALLY, WHAT FEEDBACK DID YOU RECEIVE FROM THE**  
12 **STAKEHOLDERS IN THE WORKSHOPS AND DURING THE**  
13 **NEGOTIATION PROCESS?**

14 A. Stakeholders provided key feedback to the Companies throughout this process,  
15 including suggestions: 1) to utilize economic experts in determining the cost and  
16 benefits of DER to the electric system; 2) to consider the jobs created, income  
17 invested in the local economy, and tax income generated by solar businesses when  
18 determining the economic value of DER; 3) to define “local” under Act 62 as being  
19 within the borders of the State of South Carolina; and 4) to consider locational-  
20 specific incentives for customers when connecting to the grid. There was also  
21 stakeholder discussion and comments as to reducing any cost shift and the  
22 calculation of the value of solar. Stakeholders also held varying views on how to  
23 define indirect versus direct economic impacts.

1    **Q.    WHAT WAS THE OUTCOME OF THESE STAKEHOLDER MEETINGS**  
2           **AND COLLABORATION?**

3    A.    As described above, this collaborative process resulted in the Stipulation being  
4           executed by the Southern Environmental Law Center (“SELC”) on behalf of South  
5           Carolina Coastal Conservation League (“CCL”), Southern Alliance for Clean  
6           Energy (“SACE”), and Upstate Forever; Vote Solar; and the North Carolina  
7           Sustainable Energy Association. The Companies believe the engagement effort  
8           was productive and resulted in a comprehensive resolution of the issues as  
9           evidenced by the Stipulation.

10           Although the Stipulation was the culmination of these efforts, the  
11           Companies filed information about the agreed upon resolution with the  
12           Commission on September 21, 2020 and included a press release announcing the  
13           collaborative result, as shown in **Ford Direct Exhibit 3**. The Companies organized  
14           a third stakeholder workshop on September 23, 2020, which had 65 participants in  
15           attendance, to explain the resolution agreed upon by the parties, the supporting  
16           analysis, and to receive feedback and questions from the stakeholders. The  
17           Companies have also had individual meetings with stakeholders to discuss their  
18           vision of the future of solar choice to ensure that all parties were adequately  
19           informed and represented. The meeting agenda, minutes, and presentations from  
20           this stakeholder meeting are provided in **Ford Direct Exhibit 4**.

21           The Companies appreciate the time allowed by the Commission to work  
22           with stakeholders, and believe this engagement was productive and resulted in a

1 comprehensive resolution to be brought before the Commission in this and other  
2 dockets.

3 **III. CONCLUSION**

4 **Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

5 A. Yes, it does.



**Net Energy Metering Stakeholder Meeting**  
**March 12, 2020, 10:00 am – 1:00 pm**  
**1201 Main Street, 3<sup>rd</sup> Floor Conference Room, Columbia, SC**  
**or Remotely via GlobalMeet**

[Click this Link to Join Webinar](#)

Dial-in: (712) 770.4203; Participant Code: 285616

**Agenda:**

**10:00 – 10:15**

**Safety Briefing** – Jacob Colley  
**Introductions** – Round Table  
**Ground Rules** – Leigh Ford

**10:15 – 10:30**

**Overview of Act 62 and NEM** – Ashley Cooper  
**Overview of Stakeholder Process** – Thad Culley and Leigh Ford

**10:30 – 12:15**

**Utilities Presentations and Q&A**  
***Long-run Marginal Costs, Cost of Service implications of customer-generators***

**10:30 – 11:15 – Duke Energy and Q&A**

Presenters: George Brown, General Manager of Distributed Energy Technology,  
 Policy, and Strategic Investment  
 Lon Huber, Vice President, Rate Design and Strategic Solutions

**11:15 – 11:30**

**Break**

**11:30 – 12:00**

**Stakeholder Presentations**  
***Cost of Service implications of customer-generators and Q&A***  
 Presenters: Thad Culley, Regional Director, Vote Solar

**12:00 – 12:30**

**Utilities Presentations and Q&A**  
***T&D Planning***

**Duke Energy and Q&A**

Presenters: Mark Oliver, Managing Director Integrated System Planning

**12:30 – 1:00**

**Wrap Up and Next Steps**

**Meeting Location:**

1201 Main Street  
3<sup>rd</sup> floor Conference room  
Columbia, SC 29201.

Public parking is available in the garage adjacent to the building. Entrance to the parking garage is located on Lady Street.

**Contact Info:**

Leigh Ford  
803-528-5598  
[Leigh.ford@duke-energy.com](mailto:Leigh.ford@duke-energy.com)

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**Welcome!**

**Net Energy Metering Stakeholder Meeting**  
***March 12, 2020, 10:00 am – 1:30 pm***

## Safety Moment

Jacob Colley, DET Stakeholder Engagement Manager



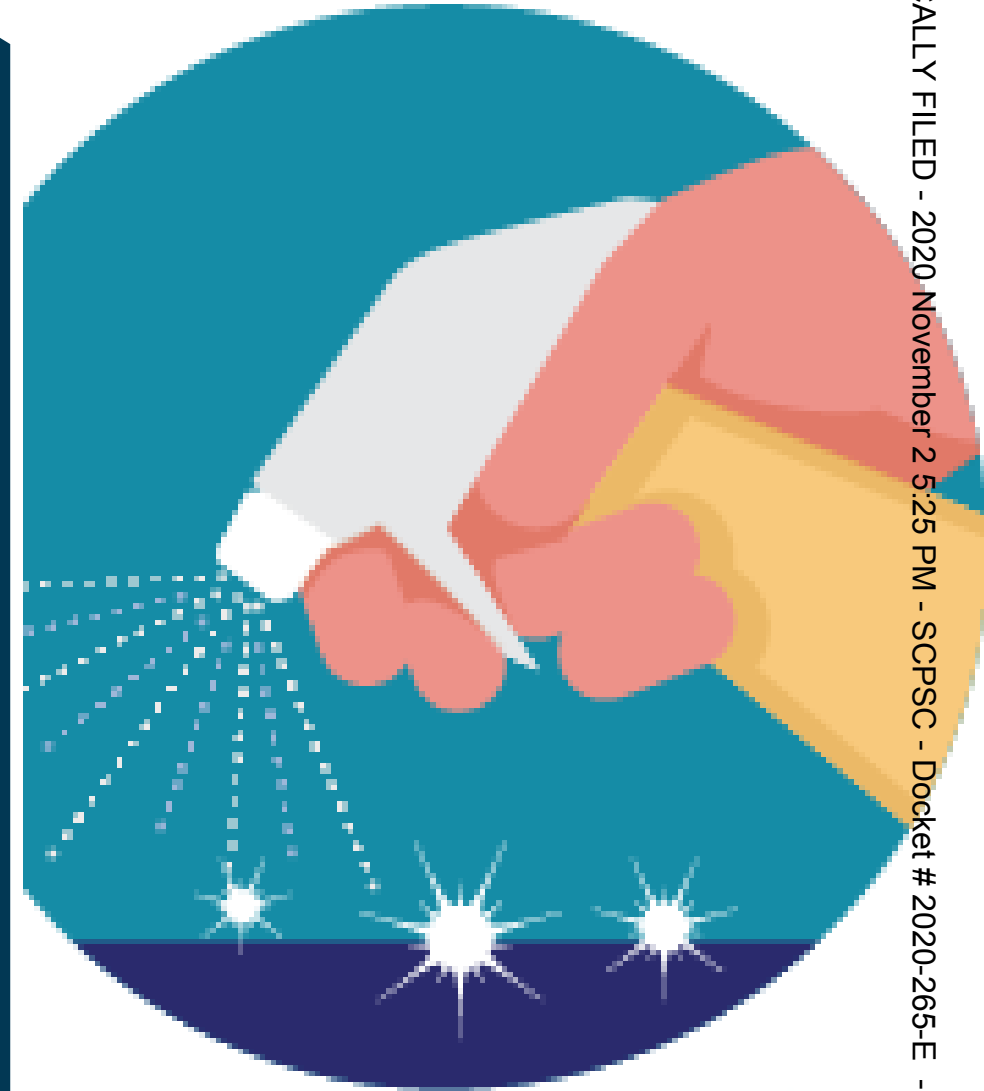
## Safety Moment – Recommended Precautions for Patient Caregiving (CDC.gov)

- Make sure that you understand and can help the patient follow their healthcare provider's instructions for medication(s) and care.
- Help with basic needs – e.g. getting groceries, prescriptions, etc.
- Monitor the patient's symptoms.
- Household members should be separated from the patient as much as possible – e.g. use a separate bedroom and bathroom, if available.
- Prohibit non-essential visitors
- Do not allow pets or other animals to be handled
- Make sure that shared spaces in the home have good air flow, such as by an air conditioner or an opened window.
- Perform hand hygiene frequently - wash your hands often and always thoroughly
- Avoid touching your eyes, nose, and mouth with unwashed hands.



## Safety Moment – Recommended Precautions for Patient Caregiving (CDC.gov)

- The patient should wear a facemask when around other people.
  - Wear a disposable facemask and gloves when you touch or have contact with the patient's body fluids
  - First remove and dispose of gloves, then, immediately clean your hands with soap and water or alcohol-based hand sanitizer.
  - Next, remove and dispose of facemask, and immediately clean your hands again with soap and water or alcohol-based hand sanitizer.
  - Place all used disposable gloves, facemasks, and other contaminated items in a lined container before disposing of them with other household waste.
- Avoid sharing household items with the patient – dinnerware, napkins, quilts/throws, etc.
- Clean all “high-touch” surfaces, such as counters, doorknobs, phones, tablet, etc. daily
- Wash laundry thoroughly.
- Discuss any additional questions with your state or local health department or healthcare provider.





# Act 62

## Solar Choice Stakeholder Meeting 1



# NEM under Act 236

Any and all costs prudently incurred pursuant to the provisions of this chapter by an electrical utility as approved by the commission and any and all commission approved benefits conferred by a customer-generator shall be recoverable by each entity respectively in the electrical utility's rates in accordance with these provisions:

- (1) The electrical utility's general rates, tariffs, and any additional monthly charges or credits, in addition to any other charges or credits authorized by law, to recover the costs and confer the benefits of net energy metering shall include such measures necessary to ensure that the electrical utility recovers its cost of providing electrical service to customer-generators and customers who are not customer-generators.
- (2) Any charges or credits prescribed in item (1), and the terms and conditions under which they may be assessed shall be in accordance with a methodology established through the proceeding described in item (4). The methodology shall be supported by an analysis and calculation of the relative benefits and costs of customer generation to the electrical utility, the customer-generators, and those customers of the electrical utility that are not customer-generators.
- (3) Upon approval of the methodology provided for in item (4), each electrical utility shall file its analysis of the net cost to serve customer-generators using the approved methodology and shall propose new net energy metering rates.
- (6) In the event that the commission determines that future benefits from net energy metering are properly reflected in net metering rates because they provide quantifiable benefits to the utility system, its customers, or both, and to the degree such benefits are not then being recovered by the electrical utility in its base rates, then such future benefits shall be deemed an avoided cost and shall be recoverable pursuant to Section 58-27-865 by the electrical utility as an incremental cost of the distributed energy resource program.

# Solar Choice under Act 62

Solar Choice is an NEM program that (i) arises from Act 62 and (ii) was not specifically contemplated by Act 236. As such, S.C. Code Ann. § 58-40-20(F)(3), as implemented by Act 62, addresses the tariff methodology for this new NEM program:

- A solar choice metering tariff shall include a methodology to compensate customer-generators for the benefits provided by their generation to the power system. In determining the appropriate billing mechanism and energy measurement interval, the commission shall consider:
  - (a) current metering capability and the cost of upgrading hardware and billing systems to accomplish the provisions of the tariff;
  - (b) the interaction of the tariff with time-variant rate schedules available to customer-generators and whether different measurement intervals are justified for customer-generators taking service on a time-variant rate schedule;
  - (c) whether additional mitigation measures are warranted to transition existing customer-generators; and
  - (d) any other information the commission deems relevant.

# Restrictions on value of solar in Act 62

S.C. Code Ann. §§ 58-40-20(A)(3), 58-40-20(G)(1), and 58-40-20(I), each as amended by Act 62, work in conjunction to prohibit (under the new tariffs):

- (i) recovering “lost revenues” for net metering in the manner formerly allowed by Act 236;
- (ii) cost-shift associated with [Solar Choice] to the greatest extent practicable; and
- (iii) subsidization associated with [Solar Choice] to the greatest extent practicable.

# Recovery under Act 62

In contrast to Act 236, Act 62 does not expressly address cost recovery for NEM programs. Rather, Act 62 indicates that:

(I) Nothing in this section, however, prohibits an electrical utility from continuing to recover distributed energy resource program costs in the manner and amount approved by Commission Order No. 2015-194 for customer-generators applying before June 1, 2021. Such recovery shall remain in place until full cost recovery is realized. Electrical utilities are prohibited from recovering lost revenues associated with customer-generators who apply for customer-generator programs on or after June 1, 2021.



# NEM and Cost of Service

Lon Huber, VP Rate Design and Strategic Solutions

March 12, 2020



- Residential Rate Design
- Act 62 Requirements
- Data on Customer Generators in SC
- Legacy Value of Solar Framework

# Residential Rate Design - How do Utilities Recover Their Costs?

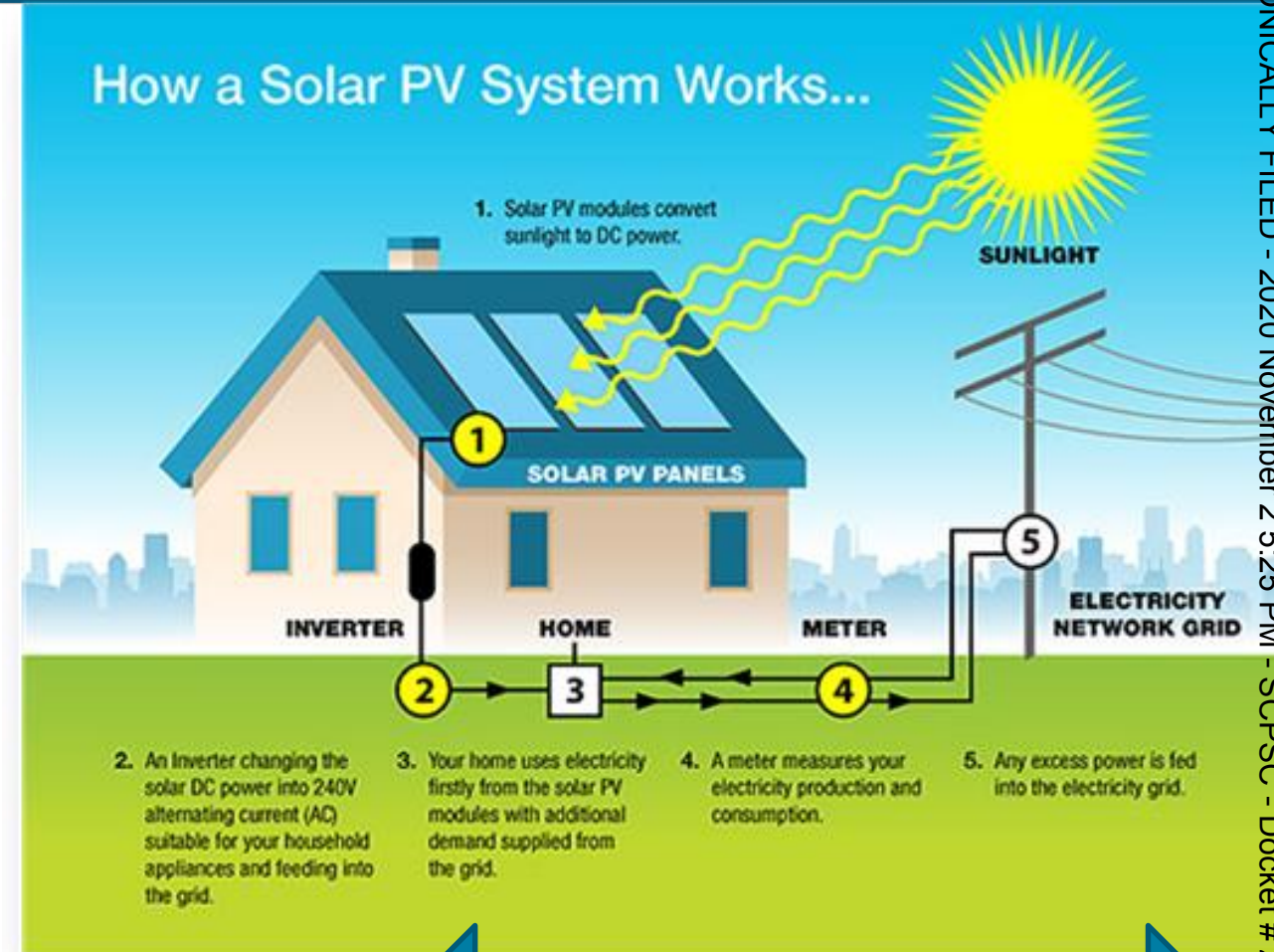
Duke Energy Carolinas (DEC)

Duke Energy Progress (DEP)






## Balancing the System in Real Time

- System operators match generation to demand in real time on a minute-to-minute and hour-to-hour basis.
- In any given minute or hour an NEM customer may be consuming power from the grid if their solar rooftop system is not producing enough power for their home's needs.
- Conversely, in any given minute or hour, the rooftop system may be producing more power than needed at the home resulting in exports of power to the grid.
- Does the current NEM framework accurately price the cost to serve customers and pay customers the marginal value of the excess power?

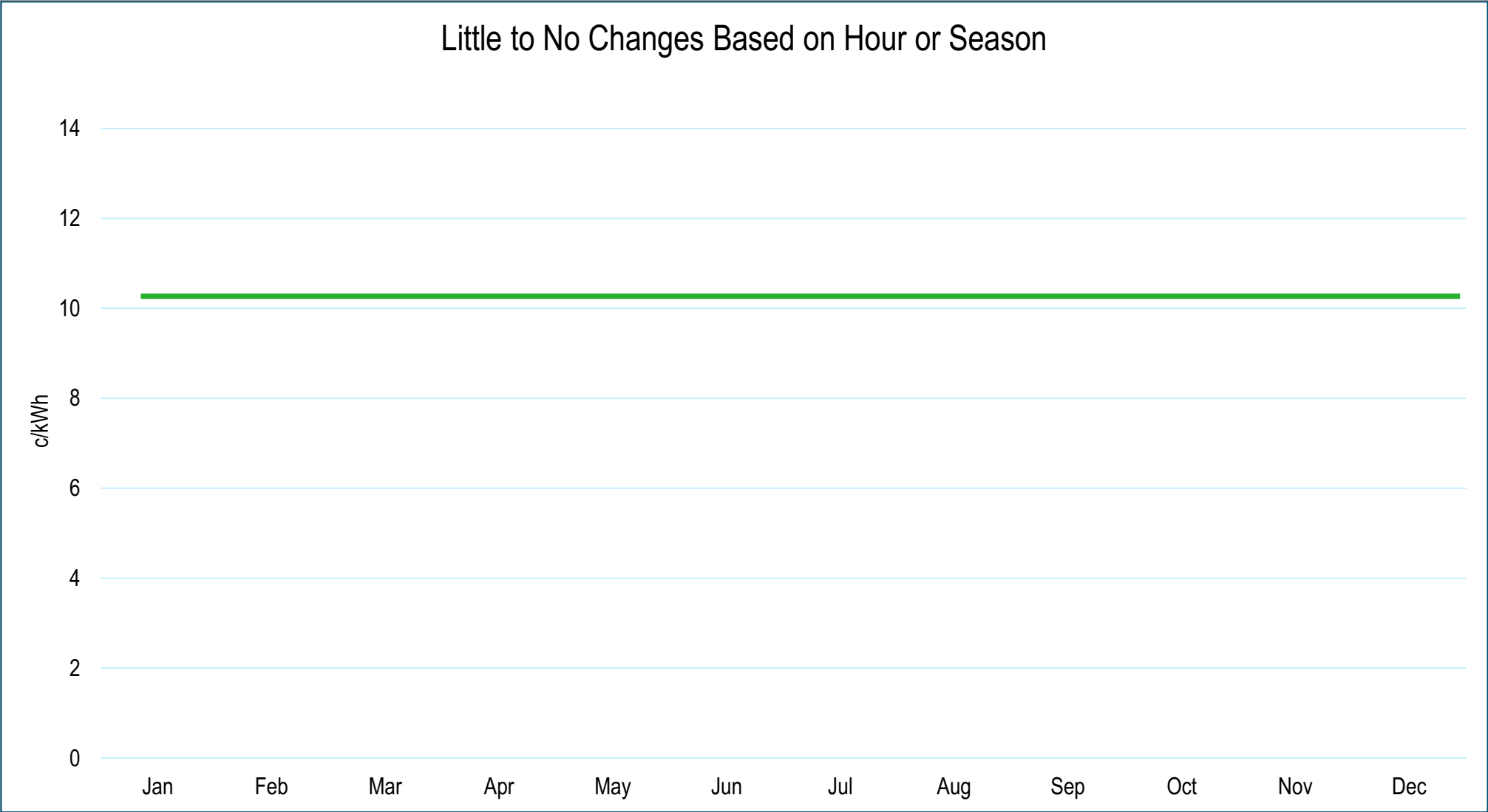


At any point in time power can flow from the grid into the home or conversely from the home onto the grid

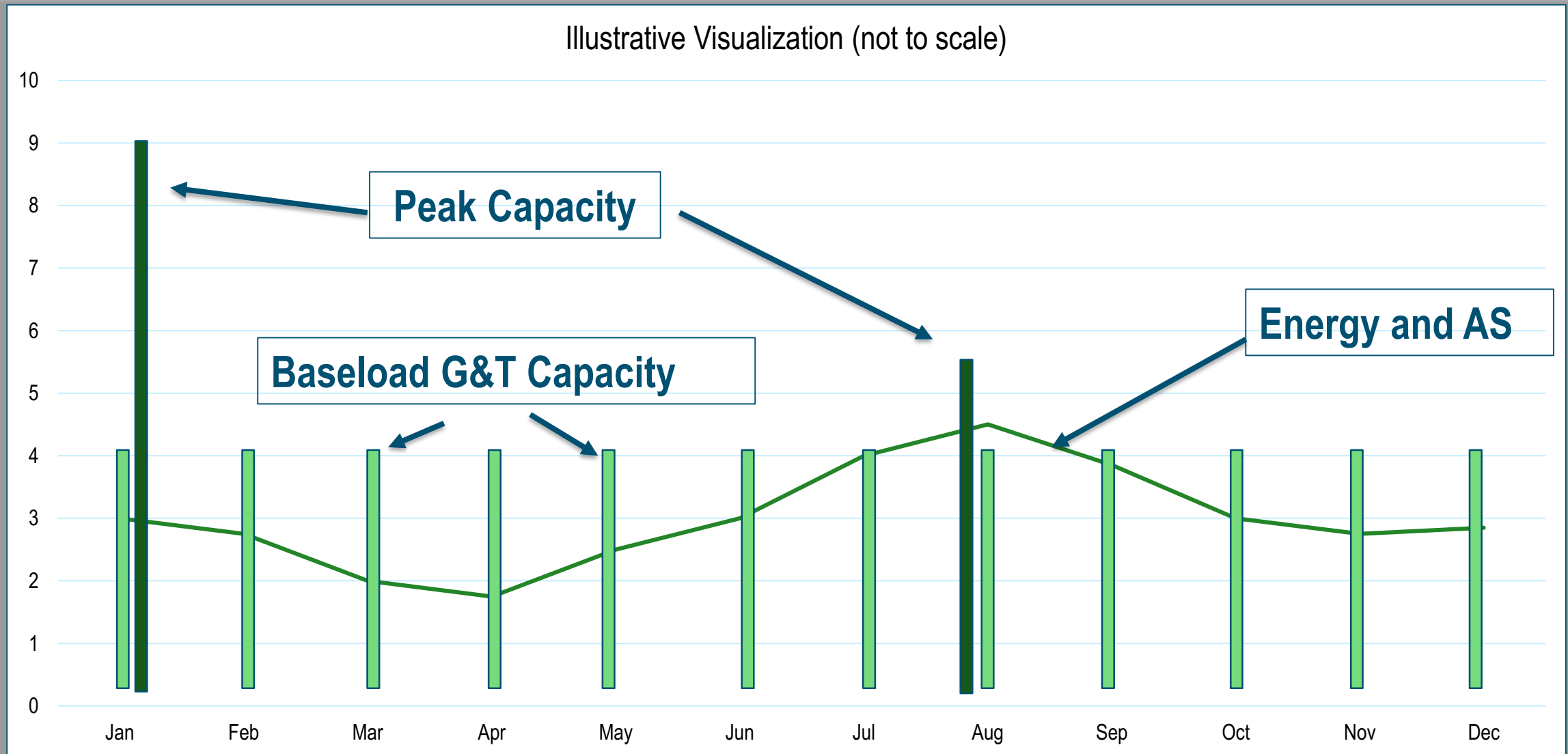
# Cost Classifications

- **Energy** 
  - Unit: kWh
  - Examples: fuel, purchased power, emissions
  - ~20% of residential costs in DEC, ~35% of costs in DEP
- **Customer** 
  - Unit: per customer
  - Examples: cost of connection and minimum distribution, billing, customer support
  - ~20% of residential costs in both DEC and DEP (SC)
- **Demand (Capacity)** 
  - Unit: kW
  - Comprised of production/generation, transmission, and distribution
  - ~60% of residential costs in DEC, ~45% of costs in DEP
  - “Like maintaining a highway with 100 lanes”
- Industry and company trends point to customer and demand costs increasing as a percentage of total costs

# Typical Residential Rate Design...






## However, in Reality...



# Cost Recovery Structure Favors NEM Customers

## For a Typical DEC-SC NEM Customer Before Adding Solar:

- Energy 
  - ~20% of residential cost of service
  - ~90% of revenue through volumetric energy charge
  - Easiest charge to offset through NEM
- Customer 
  - ~20% of residential cost of service
  - ~8% of revenue through fixed charge
- Demand (Capacity) 
  - ~60% of residential cost of service
  - 0% of revenue through demand charge

# Legal Requirements

### Legacy NEM Analysis

- “The cost of service implications of customer-generators on other customers . . . including an evaluation of whether customer-generators provide an adequate rate of return to the electric utility . . . [58-40-20(D)(2)]

### Solar Choice Tariff Requirements

- “Eliminate any cost shift to the greatest extent practicable” . . . “while also ensuring access to customer-generator options for customers” . . . [58-40-20(G)(1)a]
- “Permit solar choice customer-generators to use customer-generated energy behind the meter without penalty” [58-40-20(G)(1)b]

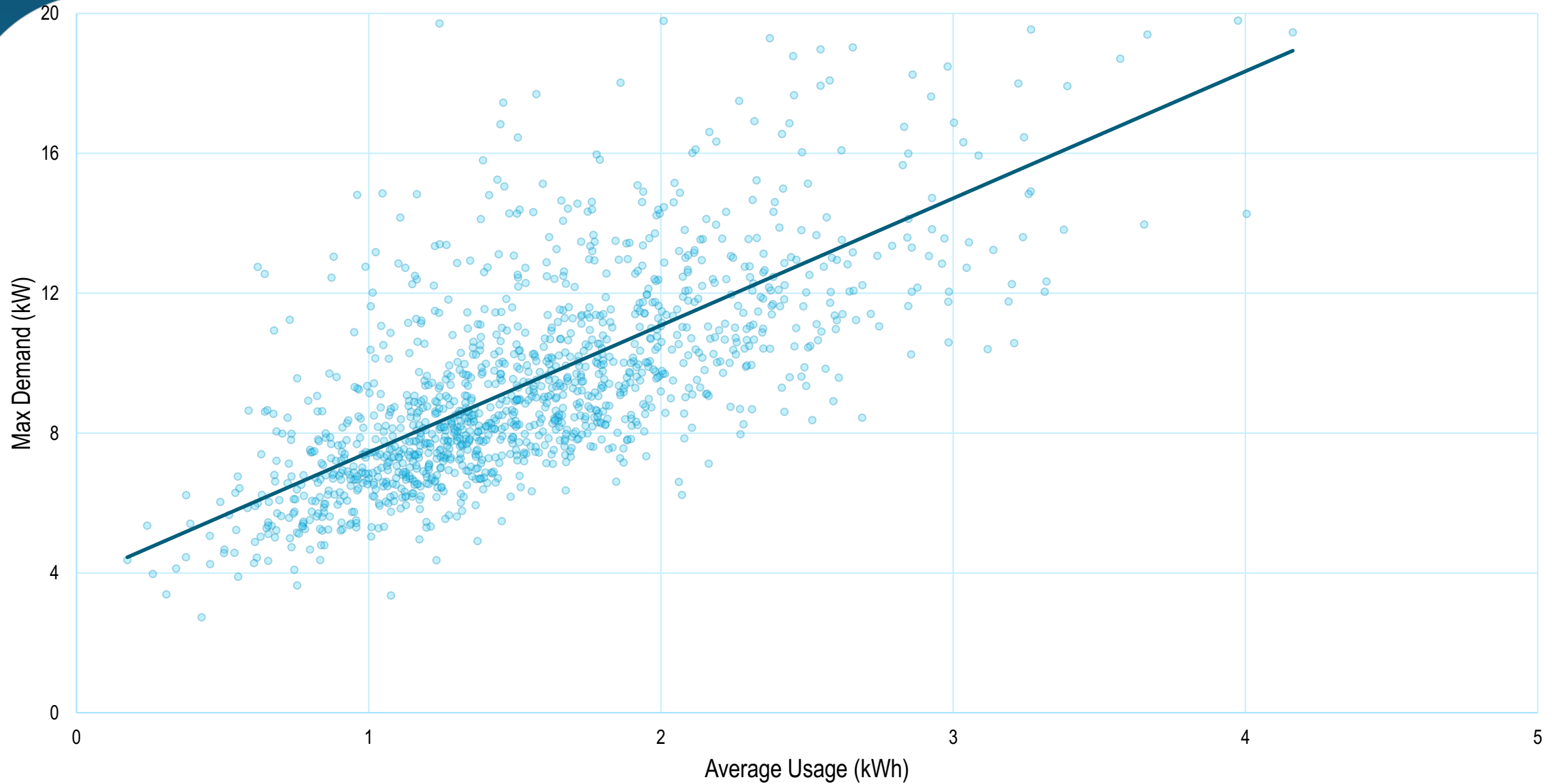
## Data on Customer Generators in SC



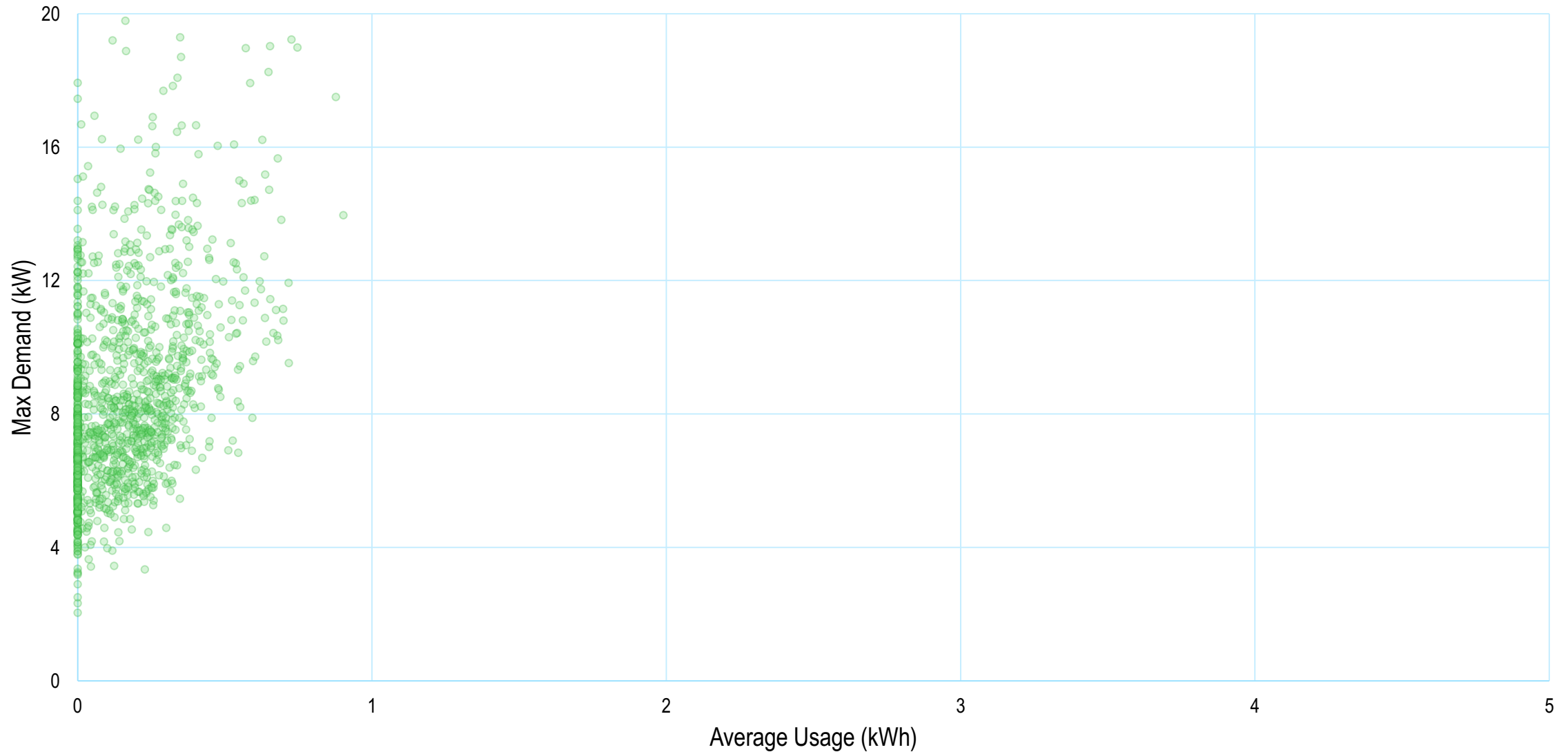
- 2019 data from 3,103 customers in DEC-SC
- Utilized subset of 1,300 customers that represents the average system size to load ratio:
  - Data collected for at least 9 months worth of data
- Average Load for Subset: 1,150 kWh
  - Average for residential class in DEC-SC: 1,070 kWh
- Average Solar Generation for subset: 1,035 kWh

# Conventional Rates Roughly Reflect CoS with Non-Solar Customers Because of Correlation Between Usage and Demand

FORD DIRECT EXHIBIT 1  
Page 26



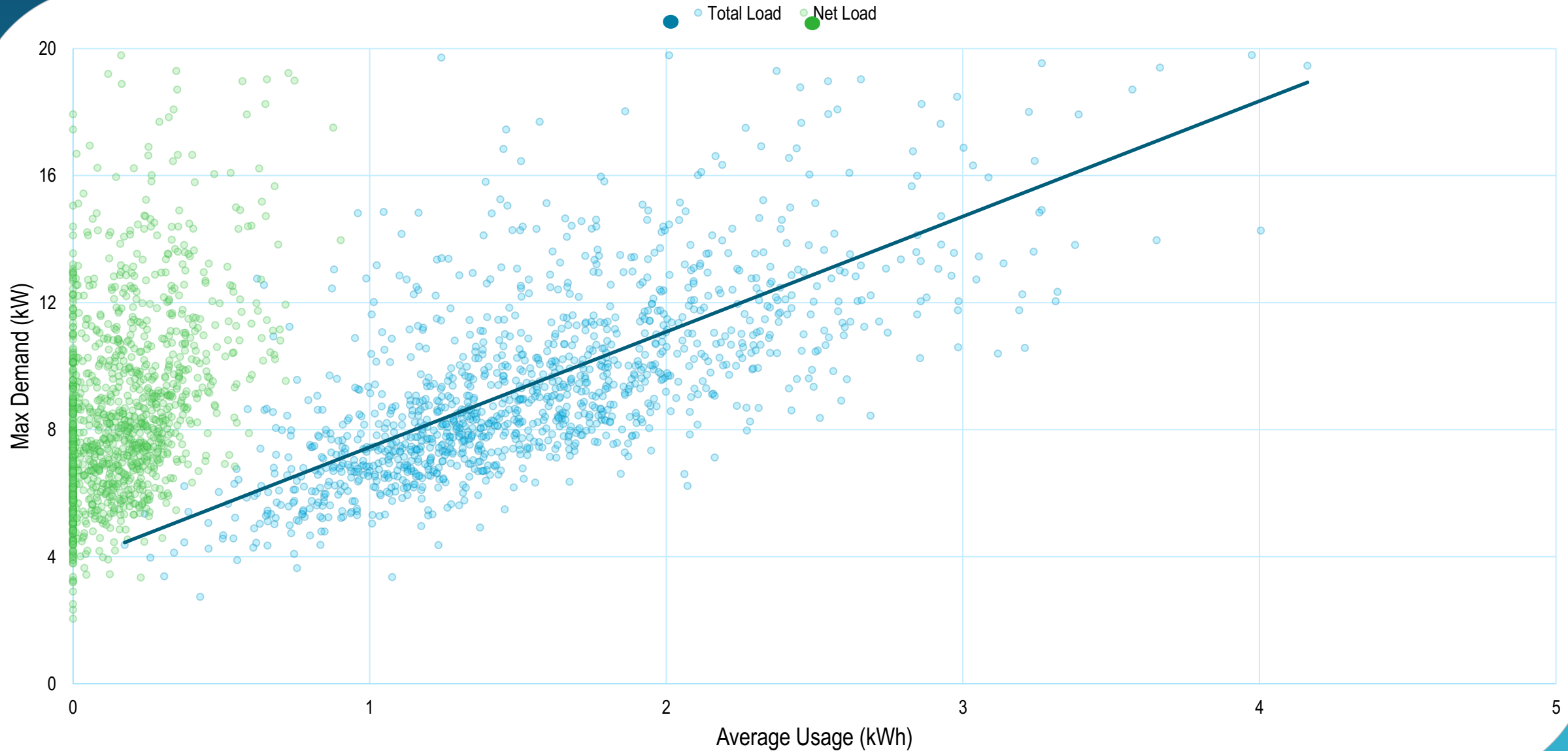
# Solar Removes Correlation Between Demand and Usage



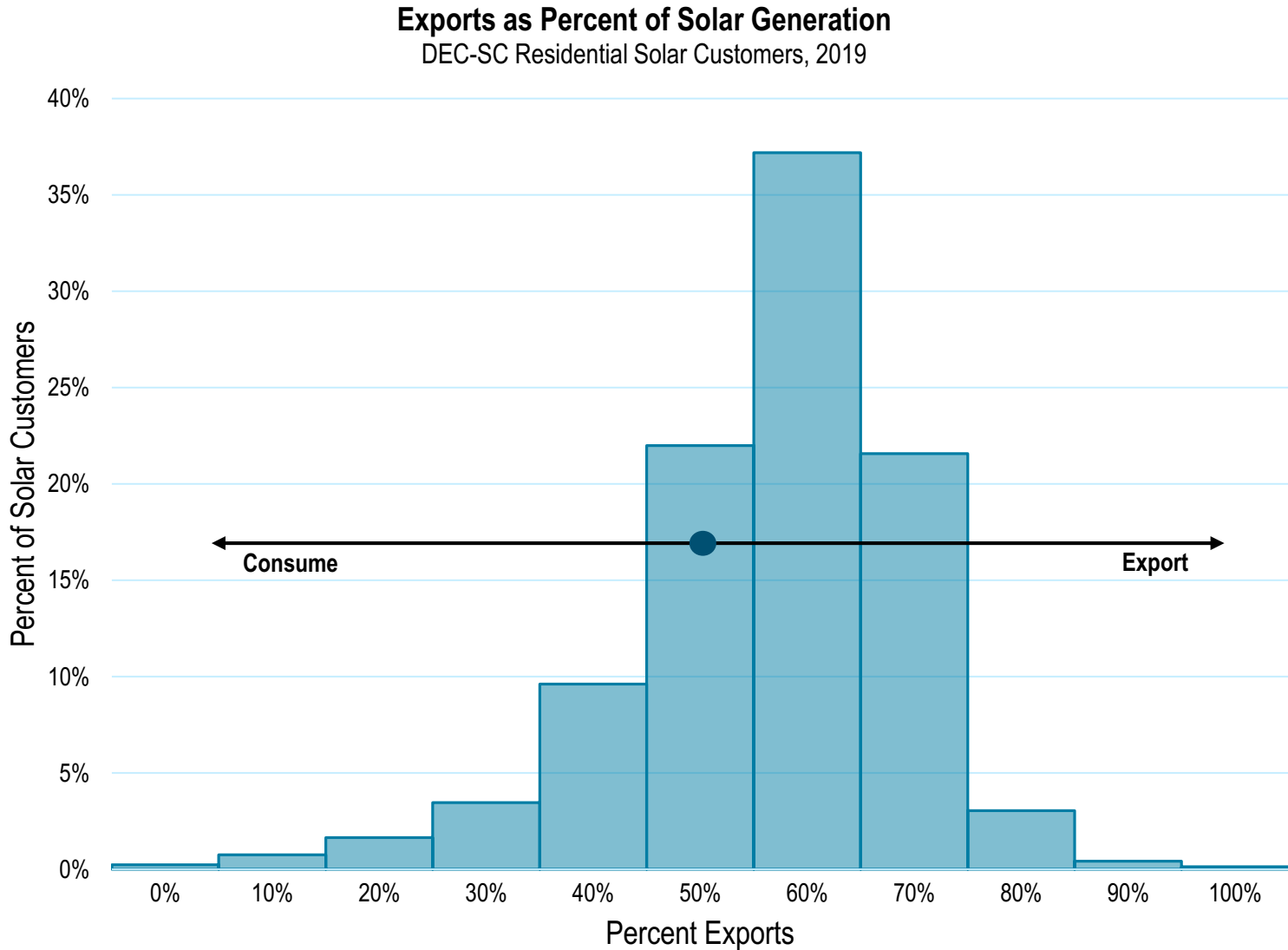
# High Volumetric Rates are Not Appropriate for High-Demand, Low Usage Customers

FORD DIRECT EXHIBIT 1

Page 28



# The Average DEC SC Customer Exports 57% of the Energy They Produce

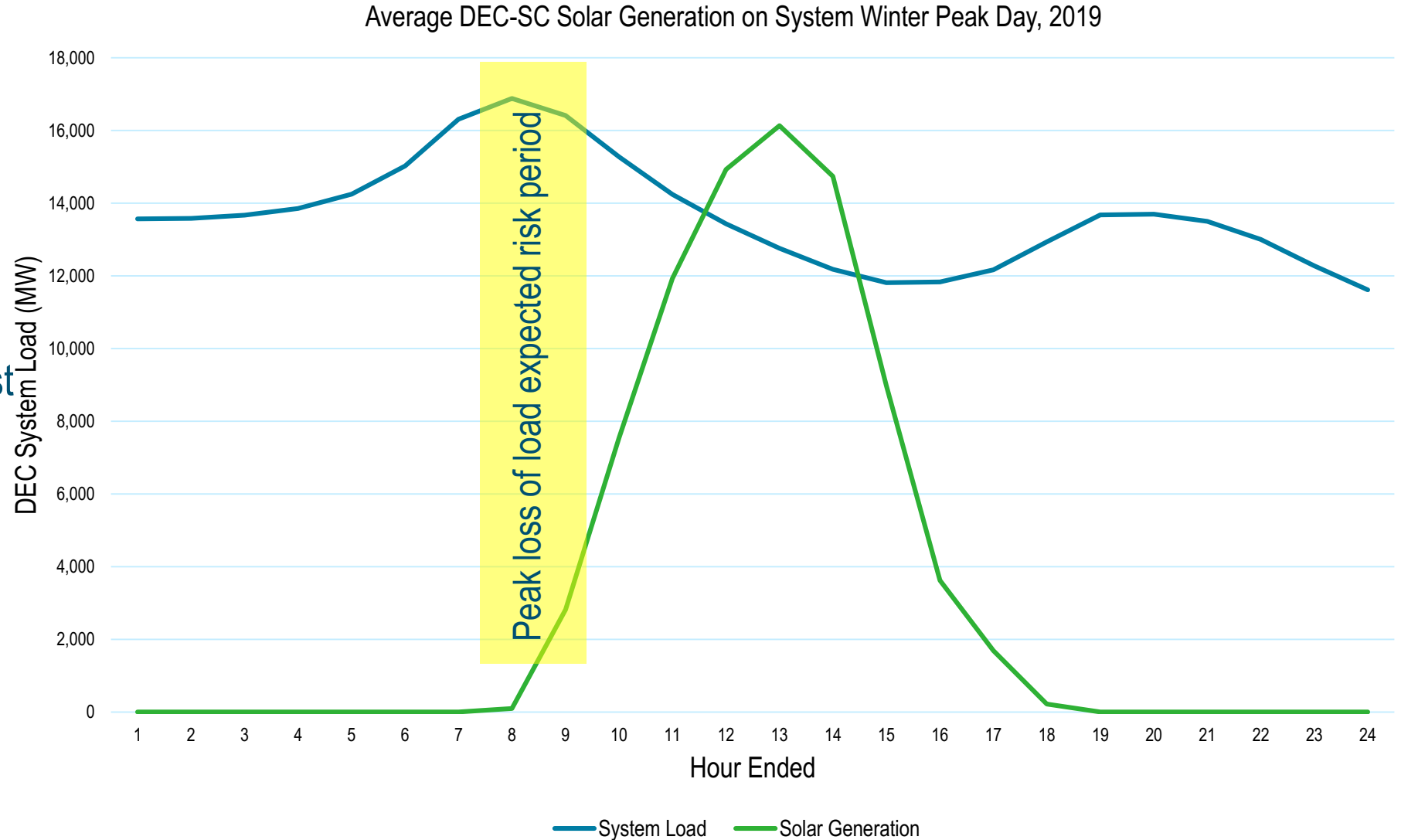


# Solar Production is not Coincident with Loss of Load Risk Hours

FORD DIRECT EXHIBIT 1

Page 30

- ~90% of annual expected loss of load risk for DEC occurs in Winter
- The hours ended 7 through 9 have the highest loss of load risk
- Rooftop solar generation produces little energy during these hours



# Legacy Value of Solar Framework

George Brown, General Manager of DET Policy and Strategic Investment

## Legacy Structure – Utility Collects Contribution Shortfall

- Estimate the Contribution Shortfall from NEM Solar customers after giving the customer credit for the System Benefits resulting from NEM – two step calculation:
- Step 1: Revenue Gap from the NEM Solar customer equals Average Revenue Without NEM Solar minus Average Revenue with NEM Solar
- Step 2: Contribution Shortfall equals the Revenue Gap minus System Benefits (Value of Solar multiplied by all Solar Production)
- Aggregated Contribution Shortfall (also called the NEM Incentive) is collected from all customers via the Distributed Energy Resource Program



## Refinements to Net Metering Framework since Act 236

- Utilize average NEM customer data rather than average residential data
  - Production meters have allowed for the collection of data from actual NEM customers instead of modeled NEM customers
  - NEM customers consume more energy than the average residential customer
- Align with methodology of DSM/EE programs
  - Utilize standard methods across energy resources

## Legacy Net Energy Metering (“NEM”) Methodology

- +/- Avoided Energy
- +/- Energy Losses/Line Losses
- +/- Avoided Capacity
- +/- Ancillary Services
- +/- Transmission and Distribution (“T&D”) Capacity
- +/- Avoided Criteria Pollutants
- +/- Avoided CO<sub>2</sub> Emission Cost
- +/- Fuel Hedge
- +/- Utility Integration & Interconnection Costs
- +/- Utility Administration Costs
- +/- Environmental Costs
- = **Total Value of NEM Distributed Energy Resource**





# Cost of Service Study for Customer-Generators in Act 62

**Thad Culley, Regional Director and  
Regulatory Counsel, Vote Solar**

**[thad@votesolar.org](mailto:thad@votesolar.org)**

March 12, NEM Technical Workshop

## § 58-40-20 (D)(2)

- In evaluating the costs and benefits of the net energy metering program, the commission shall consider:
  - “the cost of service implications of customer-generators on other customers within the same class, including an evaluation of whether customer-generators provide an adequate rate of return to the electrical utility compared to the otherwise applicable rate class when, for analytical purposes only, examined as a separate class within a cost of service study;”

# Why include a COSS for evaluating NEM?

- A cost of service study can provide a relatively standardized perspective on whether net metered customers are paying more or less than what it costs the utility to serve them under a given tariff (and within a specific rate class)
- In Act 62, it is recognized as a necessary component to evaluating the costs and benefits of net metering, but is not solely determinative of whether a subsidy exists or what the successor tariff should be
- A purely wholesale value (value of solar) approach fails to capture the other aspects of a customer-generator that influence the cost to serve and benefit or burden the system (contributions to peak demand, nature and character of use of the system)

# What does a COSS tell us about NEM?

- Do C-G have a unique cost of service when analyzed separately?
- How much revenue do C-Gs contribute toward the cost of service?
- Is there a potential cost shift between customers within a class with and without behind the meter solar?
- Do C-G produce any allocation benefits to the class by reducing contribution to system peaks or other cost drivers?
- How does rate design influence revenue collection?



# What doesn't a COSS tell us about NEM?

- What is the value of solar to the system?
- Conclusive evidence of cross-subsidization? (No!)
- Economic benefits to the state?
- Can solar displace future generation, transmission, or distribution capacity? (not in embedded COSS)
- What are the long-term benefits of solar?

# Data needs for a NEM COSS (Examples, not exhaustive)



- Load research (8760 data) that includes statistically significant number of C-G or interval data from all C-Gs using smart meters
- Interval production data from C-G systems (to match to 8760 load data)
- Program data (customer count, installed capacity, rate of adoption, tilt and azimuth)
- Historic load data (before C-G installed solar) for comparison

# Examples from other jurisdictions

- Utah PSC NEM framework
- Oklahoma Gas & Electric 2015 rate case
- 2013 E3 NEM Evaluation
- New Hampshire NEM 2.0 Docket
- Louisiana PSC Consultant Report

NOTE: Vote Solar does not necessarily endorse any of these approaches as a model and many represent utility litigation positions. These examples are offered here solely for purposes of discussion and illustrating the range of results.



# Utah: PSC Cost-Benefit Framework

- Utah PSC required by statute to “determine a just and reasonable charge, credit, or ratemaking structure, including new or existing tariffs, in light of the costs and benefits” [of the net metering program].
- PSC rejected \$4.25/month NEM facilities charge in 2014 GRC because the record lacked cost-benefit information (statute passed after application filed).
- PSC ordered RMP to undertake load research study on customer-generators and opened a separate docket to explore the determination of costs and benefits.
  - Phase 1: Development of NEM cost-benefit framework
  - Phase 2: Application of framework to determine costs and benefits and to establish a just and reasonable charge, credit or ratemaking structure

# Utah PSC: NEM COS Framework

- Comparative Cost of Service Studies
  - Actual cost of service study (ACOS) based on test year measured loads
  - Counterfactual cost of service study (CFCOS) based on estimated loads w/out NEM
  - Evaluate difference in class revenue requirement and revenue collected, including jurisdictional allocation savings (JAM)
- Shortcomings: single historic test year (embedded COSS); no accounting for future benefits or resource benefits

# Utah: Rocky Mountain Power Application

- RMP argued its COS shows residential C-G only paying 60% of COS, with commercial C-G schedules paying more than the cost of service (109%)
- **Not litigated**; stipulation reached agreeing to retail credit step down, beginning with 92.5% retail credit for exports (*passed through energy balancing account, similar to fuel adjustment*); C-G in transition period remain on tariff for 18 years.
- Future proceeding (now ongoing) will determine export rate, rate design addressed in future GRCs

# OG&E: GRC NEM COSS

- Using 4CP allocation for production and transmission demand, unit costs of DG customers significantly lower than other schedules (DG on mandatory TOU)

Table 2. Comparative Residential Unit Cost Per Customer/Month <sup>39</sup>					
	Res-DG	Res-Std	Res-TOU	Res-VPP	Res-CPP
Customer Component	\$24.54	\$28.64	\$26.07	\$27.20	\$24.57
Energy Component	\$0.35	\$0.37	\$0.45	\$0.42	\$0.39
Demand-Production	\$17.65	\$35.19	\$38.17	\$26.44	\$29.71
Demand-Transmission	\$5.20	\$9.78	\$10.69	\$7.60	\$8.40
Demand-Distribution	\$11.03	\$13.08	\$13.19	\$14.37	\$11.89
Total	\$58.77	\$87.06	\$88.57	\$76.03	\$74.96

# OG&E: NEM COSS Study

- Lower cost of service for DG in OG&E territory, combined with other policy features, results in higher relative rate of return than other residential schedules.
- Doesn't include value of surrendered monthly net excess credits (so actually higher)

**Table 1. Return on Rate Base for Residential Rate Schedules**

	Total Residential Service (Col. 1)	Residential Standard (Col. 2)	Residential TOU (Col. 3)	Residential VPP (Col. 4)	Residential CPP (Col. 5)	Residential DG (Col. 6)
Line 31 (Return on	5.33	5.18	4.89	6.28	6.32	7.23



# E3 2013 NEM Evaluation COSS

- NEM, in the aggregate, meets cost of service
- Results for residential heavily driven by 4-tier rates, (highest tier ~\$0.36/kWh, no BFC)
- COSS evaluation conducted as supplement to more traditional cost-benefit analysis

	PG&E		SCE		SDG&E		All IOUs	
	Without DG	With DG	Without DG	With DG	Without DG	With DG	Without DG	With DG
Residential	171%	88%	152%	86%	101%	54%	154%	81%
Non-Residential	128%	106%	110%	105%	124%	122%	122%	112%
Total	146%	99%	122%	100%	119%	111%	133%	103%

# New Hampshire NEM 2.0 Docket

## NH PUC Docket 2016-576



VOTE SOLAR

- Unitil (one of three utilities) presented NEM COSS results below
- No interval data available for C-G; no C-G included within load research sample
- Results based on approximations, criticized by PUC Staff witness and intervenors for being incomplete

**Table 3 Earned Return by Customer Group and Cost Study**

	Residential	Solar
Base	-1.48%	-12.27%
Counterfactual	-1.48%	6.08%
Solar Class	-1.46%	-15.55%

# Louisiana PSC NEM Study

**Table 34: Solar NEM Customer Contributions to IOU COS (active 2013 Installations Only)**

	Annual Per NEM Customer Contributions to COS		Aggregate Annual NEM Contribution to COS		Percent of COS Recovery	
	without NEM ----- (\$)	with NEM ----- (\$)	without NEM ----- (\$)	with NEM ----- (\$)	without NEM ----- (%)	with NEM ----- (%)
CLECO	\$ 777.59	\$ (451.19)	\$ 736,376	\$ (427,276)	157.7%	66.5%
EGSL	\$ 500.59	\$ (557.92)	\$ 230,269	\$ (256,643)	141.8%	53.4%
ELL	\$ 411.28	\$ (504.31)	\$ 929,906	\$ (1,140,238)	139.2%	51.9%
SWEPCO	\$ 946.83	\$ 57.09	\$ 608,813	\$ 36,710	190.6%	105.5%
<b>Total IOU</b>			<b>\$ 2,505,364</b>	<b>\$ (1,787,445)</b>	<b>157.3%</b>	<b>69.3%</b>

# Topics for further conversation

- Are existing COS methodologies sufficient?
- Does DER, AMI, and grid modernization create an opportunity to update cost classifications (energy, demand, customer)

# Thank You!

- Thad Culley
- [thad@votesolar.org](mailto:thad@votesolar.org)





# Integrated System and Operations Planning Discussion

SC NEM Stakeholder Meeting  
March 12, 2020



ISOP

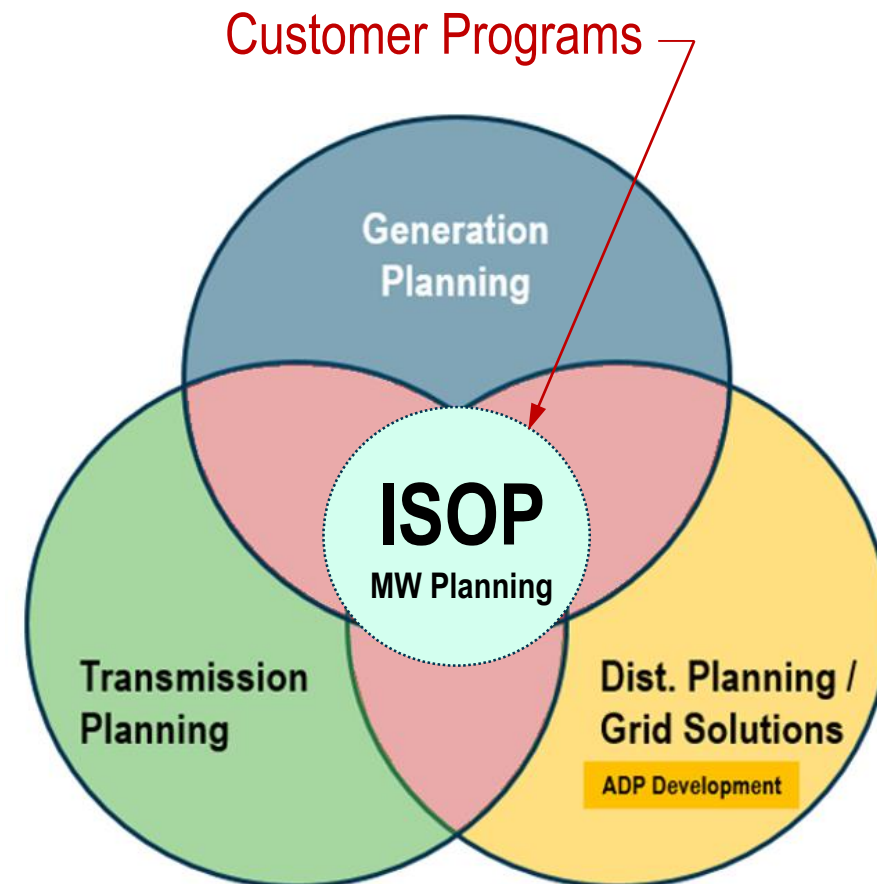
Integrated System & Operations Planning



# Duke's ISOP Journey

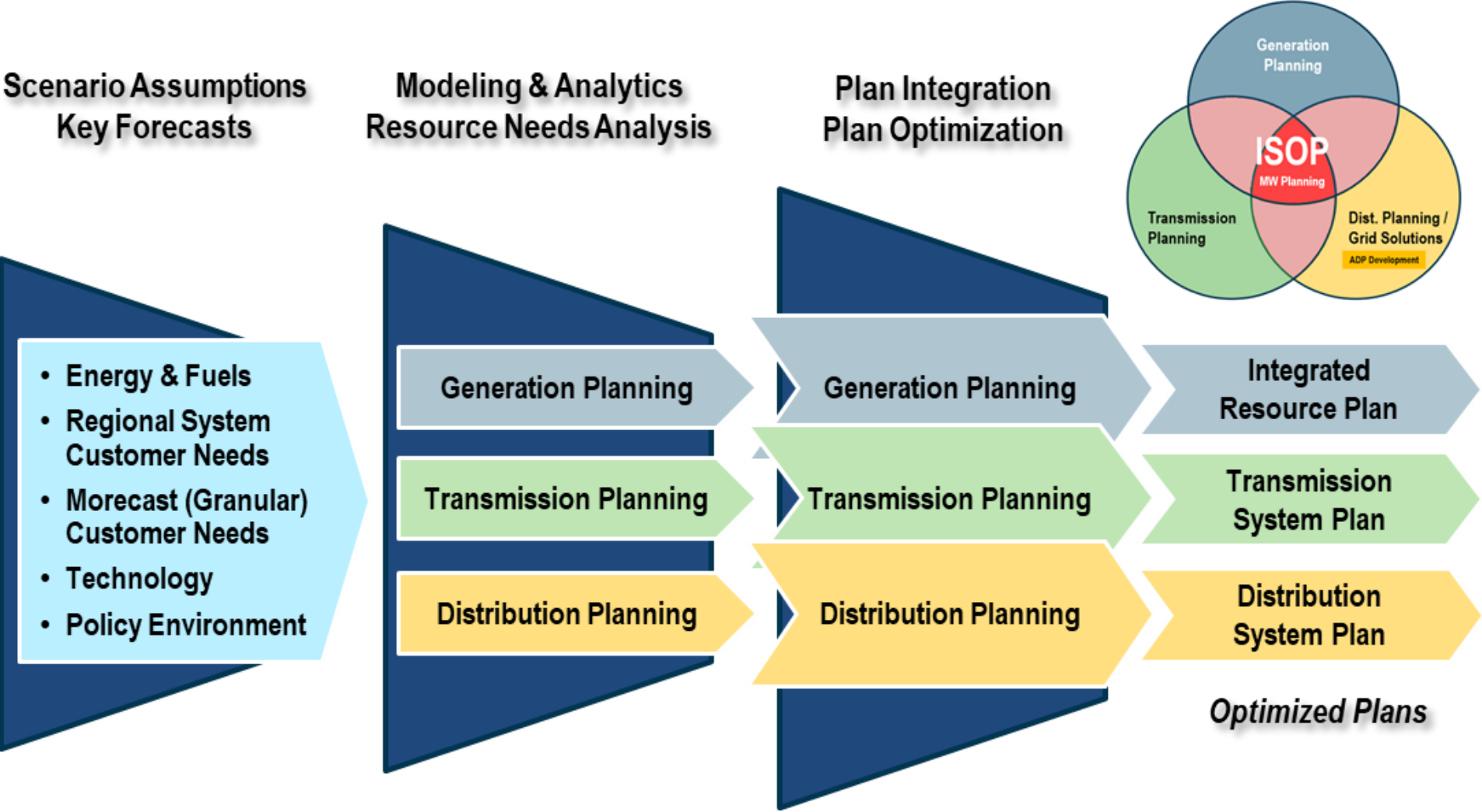
The Integrated System & Operations Planning (ISOP) vision is a planning framework that optimizes capacity and energy resource investments (MW/MWh) across Generation, Transmission, Distribution and Customer Solutions. The framework will address:

- Operationally feasible plans while accommodating rapid renewable growth
- Enhanced modeling to value new technologies such as energy storage, electric vehicles, and intelligent grid controls/customer programs (non-traditional solutions for Distribution and Transmission)
- Ability to evaluate different asset portfolios across a broader range of potential future scenarios



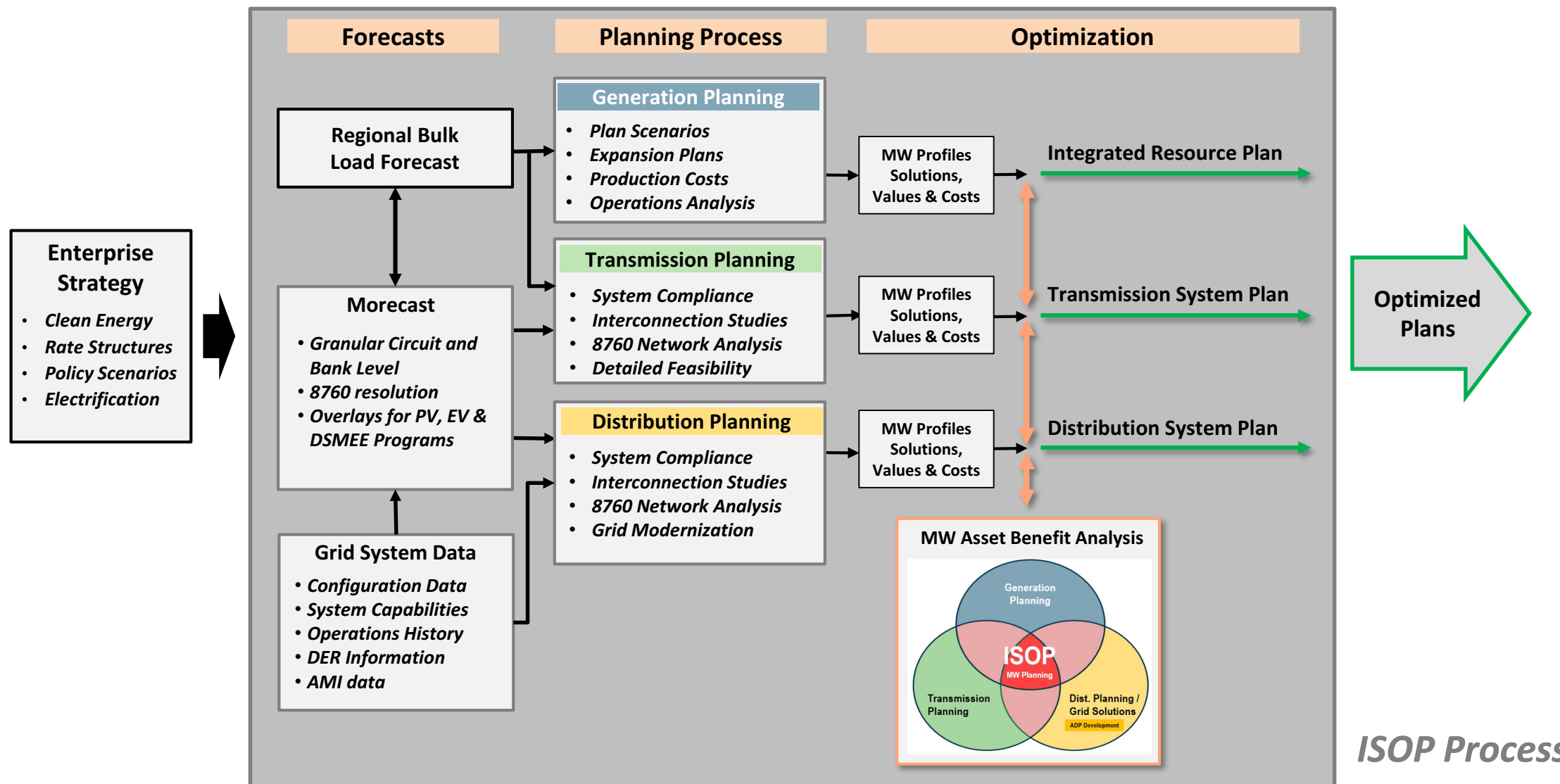


# Duke's ISOP Journey



*ISOP drives optimization through collaboration and integration*

# Aligning and Linking Process, Tools and Data



# Expanding the Scope of Scenario Analysis



## Supply Side

- Assumptions for new generation technologies
- Views of resource mix (central and distributed resources) and reliance on external resources
- Appropriate levels of precision for locating planned resources

## Demand Side

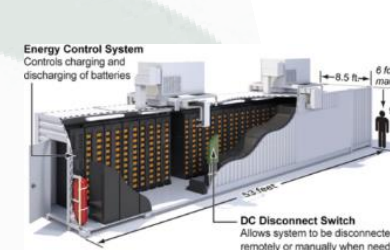
- Customer requirements and expectations in the future envisioned
- Enhanced assessment of load-modifying resources and programs
- Appropriate approach for location of new resources



## Identify Points at Which Potential Plans Diverge

## NTS/Storage Potential

- Expanding the view for storage needs and potential on the system
- Anticipation of storage operations and use cases for future energy network support



## Grid Implications

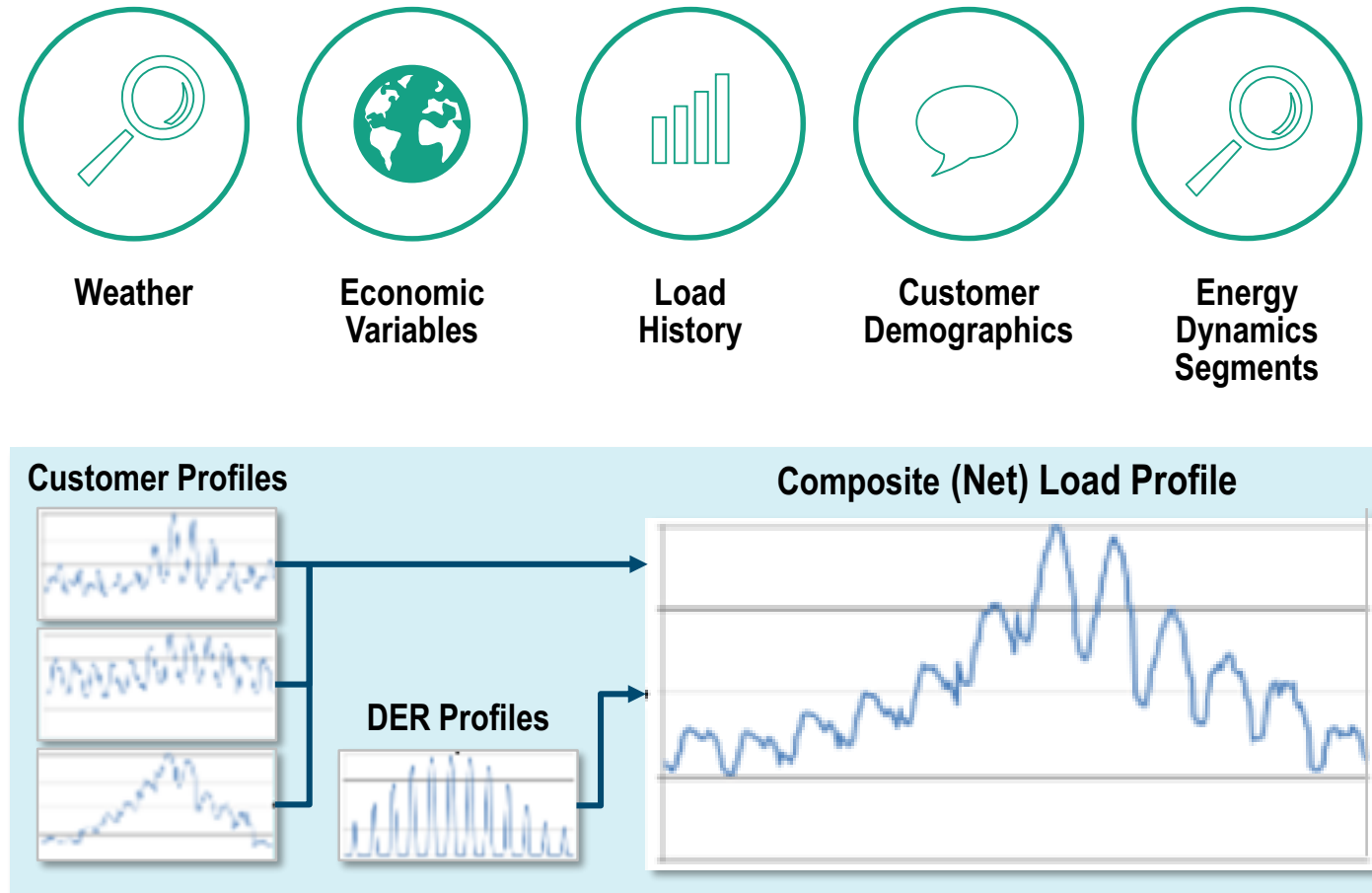
- Informed view of distributed resources and capabilities operating on the system
- Grid configurations and capabilities needed to support envisioned future operations



# Granular Load Forecasting

- 10-year hourly load forecasts for each distribution circuit
- Bottom-up feeder-level forecasts inclusive of DERs and EVs (gross and net load)
- Distribution planners can make circuit-level forecast adjustments
- AMI data will be useful as it becomes available to forecasters
- The new tools will support development of forecast scenarios

***These are critical new inputs for the advanced distribution planning process***



# Advanced Distribution Planning (ADP)

## Incorporate sophisticated granular load forecasts

- Current 3-5 year window evolving to 10 years
- Forecasting is moving from individual distribution planners to load forecasters collaborating with the planners
- Developing new capabilities for multiple planning scenarios

## New power flow demands

- From peak hour assessment to 8760 assessment

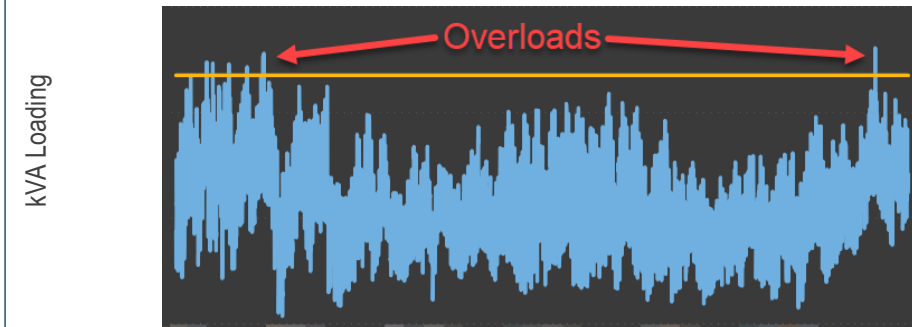
## Assessment of new solutions

- DERs including battery storage systems
- Capture benefits of D-sited options for G and T

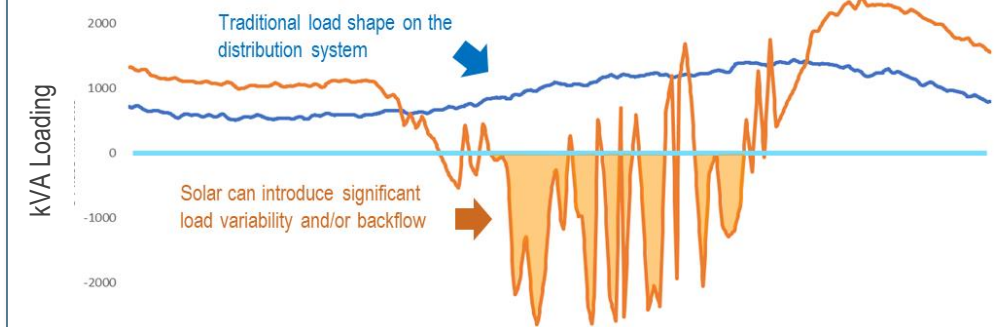
## Automation of tools and configuration data

- Allows for more complex planning for a dynamic grid

Forecasted Feeder Loads and Winter Rating



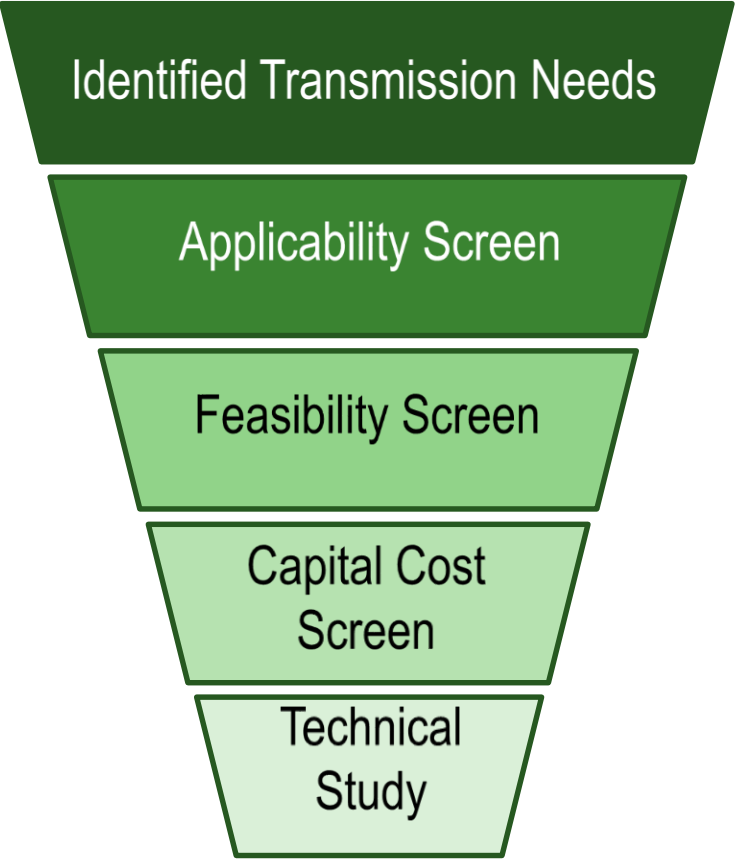
DER Impacts on Circuit Loading



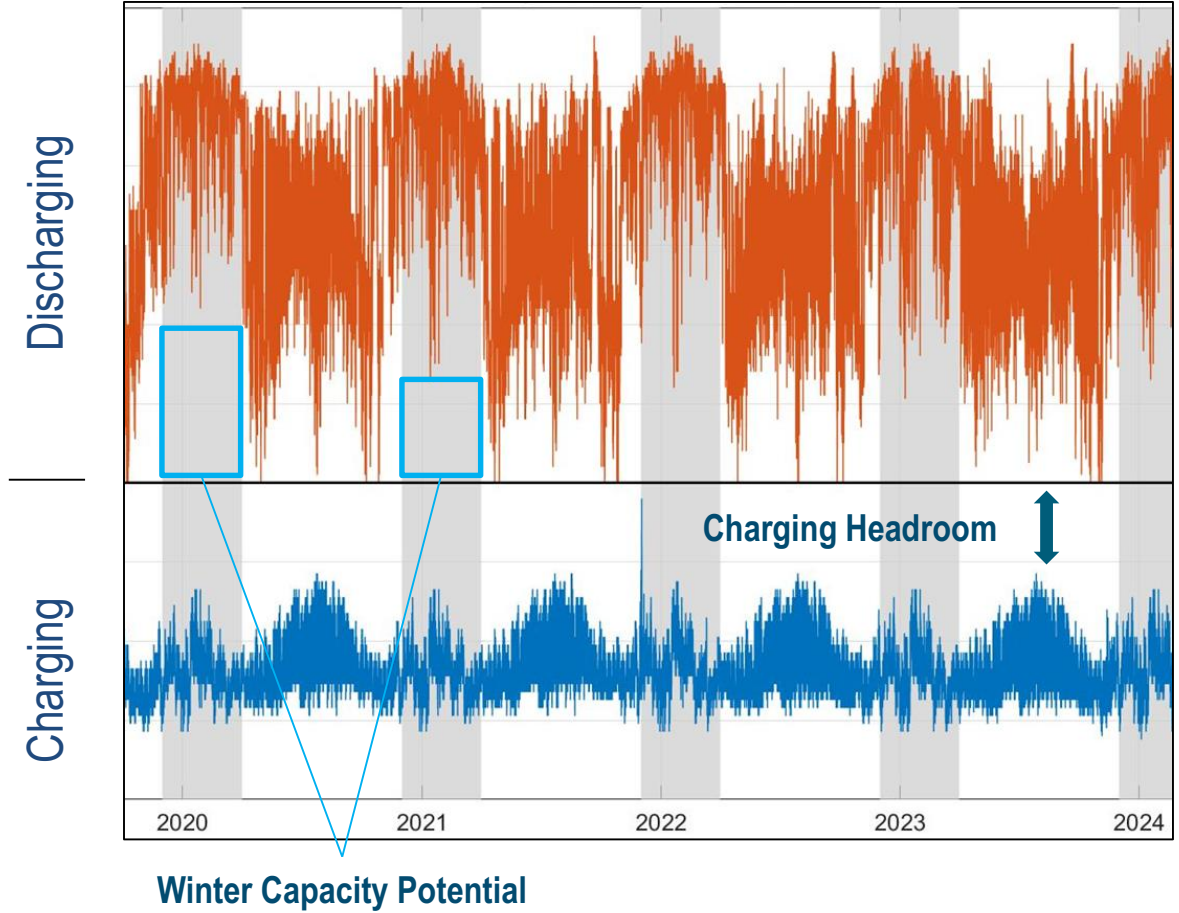


# Evaluating Non-Traditional Solutions for Transmission

## Screening for NTS Opportunities



## 8760 Power Flow Modeling (Illustrative Battery Analysis)



## Increasing Stakeholder Engagement in the Carolinas

- ISOP Stakeholder Workshop Sessions and Webinars
- IRP Stakeholder Forums for the 2020 Planning Cycle
- Communicate progress and increase transparency and credibility of new tools and approaches
- Work towards a better understanding of:
  - Current accepted utility planning practices as well as future planning challenges
  - Available and relevant utility planning tools, and the gaps that we need to address
  - Stakeholders' goals, priorities and ideas to inform our approach

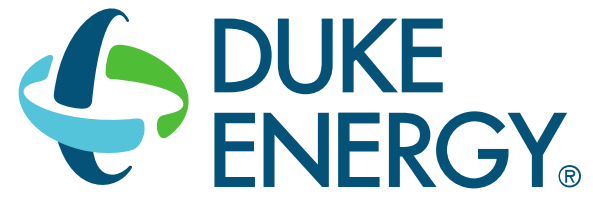
## Interconnection Queue Reform

Develop and offer to publish DG Guidance Maps if there is interest

Objective to introduce ISOP elements in 2022 to complement the IRP process in the Carolinas







**Net Energy Metering Stakeholder Meeting**  
**March 12, 2020, 10:00 am – 1:00 pm**  
**1201 Main Street, 3<sup>rd</sup> Floor Conference Room, Columbia, SC**  
**or Remotely via GlobalMeet**

**Welcome:**

Leigh Ford of Duke Energy welcomed stakeholder participants.

**Safety Briefing:**

Jacob Colley of Duke Energy provided a safety briefing regarding the Corona virus.

**Ground Rules:**

Leigh Ford explained that the intent of the collaborative is to share ideas and develop the new net metering tariff. General ground rules include:

- Share what's on your mind.
- Be present and challenge assumptions, yours included.
- Focus on our shared interests and set aside differences.
- In order to create an atmosphere of trust and openness, comments by participants, observers, and hosts should be treated as confidential and not repeated in traditional media, social media channels, or in future litigation.

Leigh Ford volunteered to serve as the secretary and the stakeholders agreed.

**Overview of Act 62 and NEM:**

Ashley Cooper of Parker Poe provided an overview of Act 236 and Act 62.

Discussion of whether Act 236 terminates or sunset after 10 years.

**Overview of Stakeholder Process:**

Thad Culley of Vote Solar discussed the successful passage of Act 62 and how we hope to use the stakeholder process to develop a successor tariff that's just and reasonable in light of benefits while determining the proper methodology. He discussed what's been considered in other states and South Carolina leveraging the what's been done around the country.

Leigh Ford addressed the proposed timeline leading up to the PSC's requirement that a new solar choice metering tariff be in place by June 1 of 2021. Due to billing system updates, Duke would like to have an Order by end of 2020 or the beginning of 2021.

**Stakeholder Timeline:**

- 3/12/2020 – Stakeholder Meeting #1
- 4/23/2020 – Stakeholder Meeting #2
- 6/1/2021 – Solar Choice Metering Tariff in effect

**Duke Timeline:**

- May 2020 – Negotiations Begin
- July 2020 – Duke files new Solar Choice Metering Tariff
- December 2020 – Duke Order Issued

Mark Furtick of Dominion Energy SC: Dominion has more leeway on their timing. Due to existing regulatory proceedings and their merger, their timeline will be 2- 3 months behind Duke.

Discussion of Duke's progress on its Customer Connect.

### **Duke Energy Presentation - Long-run Marginal Costs, Cost of Service implications of customer-generators**

Presenters:

George Brown, General Manager of Distributed Energy Technology, Policy, and Strategic Investment

Lon Huber, Vice President, Rate Design and Strategic Solutions

Lon Huber introduced himself and described his experience throughout the country, specifically his work on net metering reform. Lon provided a residential rate design overview and presented data from Duke's actual solar customers.

Discussion on rate design, cost recovery, and data provided by Duke.

George Brown spoke about the value of solar framework and how to build out benefits and costs stacks in making that calculation.

### **Stakeholder Presentation – Cost of Service implications of customer-generators**

Presenter: Thad Culley, Regional Director, Vote Solar

Thad from Vote Solar presented on cost of service studies and methodologies and provided examples of other states that have recently revised their NEM framework.

Lon Huber noted that California's design was intentional because of the policy structure in California to have higher use customers fund policy initiatives in the state.

Discussion on what integrated COS might look like in near term or long term.

### **Duke Energy Presentation – T&D Planning**

Presenters: Mark Oliver, Managing Director Integrated System Planning

Mark Oliver presented on Duke's Integrated Systems & Operations Planning process. There is an ISOP workshop scheduled for April 27 in Columbia but this may change. Information on Duke's ISOP can be found at the Company's portal: <https://www.duke-energy.com/our-company/isop>

Discussion on valuation and the availability of detailed DER data.

### **Wrap Up and Next Steps**

Leigh Ford will send the group the slides and meeting minutes. If there are any additions to the stakeholder participants, please notify Leigh. If you need to sign an NDA with Duke contact Heather Shirley Smith, Ashley Cooper, or Leigh Ford. If you need to sign an NDA with Dominion contact Mark Furtick or Kelly Arms.

The next NEM stakeholder meeting will take place April 23.

**Attendees:**

<u>Attendee</u>	<u>Organization</u>
Kelly Arms	Dominion Energy SC
Andrew Bateman	ORS
Sharad Bharadwaj	E3
Kullen Boling	Central Electric Power Cooperative
Robert Branton	Santee Cooper
Daniel Brookshire	NC Sustainable Energy Association
George Brown	Duke Energy
John Calhoun	Santee Cooper
Steve Chriss	Walmart
Sarah Cohen	SC Chamber of Commerce
Jacob Colley	Duke Energy
Ashley Cooper	Parker Poe
Thad Culley	Vote Solar
Tom Delello	Gregory Electric
Scott Elliott	SC Energy Users Committee
Leigh Ford	Duke Energy
Mark Furtick	Dominion Energy SC
Tyson Grinstead	Sunrun
Carrie Grundmann	Walmart
Dawn Hipp	ORS
Brian Horii	E3
Lon Huber	Duke Energy
Maia Hutt	Southern Environmental Law Center
Bryan Jacob	Southern Alliance for Clean Energy
Robert Lawyer	ORS
Jason Martin	Duke Energy
Lyndsey McNeely	Duke Energy
Eddy Moore	SC Coastal Conservation League
O'Neil Morgan	ORS
David Neal	Southern Environmental Law Center
Mark Oliver	Duke Energy
Justin Orkney	Duke Energy
Lisa Perry	Walmart
Marcus Preston	Duke Energy
Cole Price	Central Electric Power Cooperative
Shelley Robbins	Upstate Forever
John Rouff	AARP
Michael Seaman-Huynh	ORS
Heather Shirley Smith	Duke Energy
Ben Smith	NC Sustainable Energy Association
Neal Williams	Lockhart Power
Bruce Wood	Sunstore

## Net Energy Metering Stakeholder Meeting

*April 23, 2020, 10:00 am – 12:00 pm*

*Remotely via GlobalMeet (link below)*

[Click this link to join the meeting.](#)

Dial-In: (913)227-1201 Passcode: 158233

### Agenda:

**10:00 – 10:15**

**Welcome, Housekeeping, and Safety Briefing** – Jacob Colley  
**March 12, 2020 Meeting Minutes** – Leigh Ford

**10:15 – 10:35 - Calculating Value of DER:**

**Value of DER according to Act 236 NEM DER Methodology** – Jason Martin, Duke Energy

**Direct and indirect economic impacts of NEM to the State and the value of DER components** – Tyson Grinstead, Sunrun

**10:35 – 11:05**

**Roundtable Discussion:**

Direct and indirect economic impacts of NEM to the State  
Other value of DER components

**11:05 – 11:20**

**Successor Tariff and Rate Design** – Lon Huber, Duke Energy

**11:20 – 11:50**

**Roundtable Discussion:**

Value in bundling with other utility programs like EE, DSM, NEM  
Creative options have you seen throughout the country

**11:50 – 12:00**

**Wrap Up and Next Steps**

### Contact Info:

Leigh Ford

803-528-5598

[Leigh.ford@duke-energy.com](mailto:Leigh.ford@duke-energy.com)

**GlobalMeet Login Information:**

URL - <https://dukeenergy.pgimeet.com/Act62NEM>

1. [Click this Link to Download the FREE GlobalMeet App](#)
  - Follow instructions to download app and set up your GlobalMeet account
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- Enter your name and email address
- The Audio selection box will pop up, select Use My Phone
- Enter your telephone number and select Continue
- Once you select Continue, you will immediately receive a call from GlobalMeet.
- Press "1" to be connected to the webinar.

**Joining via GlobalMeet App is Recommended, but you can join by Phone ONLY:**

Dial-in: **1-913-227-1201**

Guest passcode: **158233**

**Welcome!**

**Net Energy Metering Stakeholder Meeting**  
***April 23, 10:00 am – 12:00 pm***

# **Welcome, Housekeeping, and Safety Briefing**

– Jacob Colley

# **March 12, 2020 Meeting Minutes and Breakout Session Overview**

– Leigh Ford



# Value of Solar Methodology and Components

Jason Martin, Duke Energy

4/23/2020



## Act 62's Requirements

Section 58-40-20 (D)(3) states that:

In evaluating the costs and benefits of the net energy metering program, the commission shall consider the value of distributed energy resource generation according to the methodology approved by the commission in Commission Order No. 2015-194

- Established methodology with Act 236 proceeding to identify the value a solar generator paired with a load center has to the utility.
- Identified the utility costs/benefits by the customer-generator from solar generation at their home or facility
- Methodology includes 11 components to be used in calculating Value of Solar.
- Components can be positive, negative or zero in value.
- Calculation is refreshed with the utility's annual fuel proceeding.

## Net Energy Metering (“NEM”) Methodology

- +/- Avoided Energy
- +/- Energy Losses/Line Losses
- +/- Avoided Capacity
- +/- Ancillary Services
- +/- Transmission and Distribution (“T&D”) Capacity
- +/- Avoided Criteria Pollutants
- +/- Avoided CO2 Emission Cost
- +/- Fuel Hedge
- +/- Utility Integration & Interconnection Costs
- +/- Utility Administration Costs
- +/- Environmental Costs

**= Total Value of NEM Distributed Energy Resource**



# Component Description

Methodology Component	Description	Calculation Methodology/Value
+/- Avoided Energy	Increase/reduction in variable costs to the Utility from conventional energy sources, i.e. fuel use and power plant operations, associated with the adoption of NEM.	Component is the marginal value of energy derived from production simulation runs per the Utility's most recent Integrated Resource Planning ("IRP") study and/or Public Utility Regulatory Policy Act ("PURPA") Avoided Cost formulation.
+/- Energy Losses/Line Losses	Increase/reduction of electricity losses by the Utility from the points of generation to the points of delivery associated with the adoption of NEM.	Component is the generation, transmission, and distribution loss factors from either the Utility's most recent cost of service study or its approved Tariffs. Average loss factors are more readily available, but marginal loss data is more appropriate and should be used when available.
+/- Avoided Capacity	Increase/reduction in the fixed costs to the Utility of building and maintaining new conventional generation resources associated with the adoption of NEM.	Component is the forecast of marginal capacity costs derived from the Utility's most recent IRP and/or PURPA Avoided Cost formulation. These capacity costs should be adjusted for the appropriate energy losses.

# Component Description

Methodology Component	Description	Calculation Methodology/Value
+/- Ancillary Services	Increase/reduction of the costs of services for the Utility such as operating reserves, voltage control, and frequency regulation needed for grid stability associated with the adoption of NEM.	Component includes the increase/decrease in the cost of each Utility's providing or procurement of services, whether services are based on variable load requirements and/or based on a fixed/static requirement, i.e. determined by an N-1 contingency. It also includes the cost of future NEM technologies like "smart inverters" if such technologies can provide services like VAR support, etc.
+/- T&D Capacity	Increase/reduction of costs to the Utility associated with expanding, replacing and/or upgrading transmission and/or distribution capacity associated with the adoption of NEM.	Marginal T&D distribution costs will need to be determined to expand, replace, and/or upgrade capacity on each Utility's system. Due to the nature of NEM generation, this analysis will be highly locational as some distribution feeders may or may not be aligned with the NEM generation profile although they may be more aligned with the transmission system profile/peak. These capacity costs should be adjusted for the appropriate energy losses.
+/- Avoided Criteria Pollutants	Increase/reduction of SOx, NOx, and PM10 emission costs to the Utility due to increase/reduction in production from the Utility's marginal generating resources associated with the adoption of NEM generation if not already included in the Avoided Energy component.	The costs of these criteria pollutants are most likely already accounted for in the Avoided Energy Component, but, if not, they should be accounted for separately. The Avoided Energy component must specify if these are included.

# Component Description

Methodology Component	Description	Calculation Methodology/Value
+/- Avoided CO <sub>2</sub> Emissions Cost	Increase/reduction of CO <sub>2</sub> emissions due to increase/reduction in production from each Utility's marginal generating resources associated with the adoption of NEM generation.	The cost of CO <sub>2</sub> emissions may be included in the Avoided Energy Component, but, if not, they should be accounted for separately. A zero monetary value will be used until state or federal laws or regulations result in an avoidable cost on Utility systems for these emissions.
+/- Fuel Hedge	Increase/reduction in administrative costs to the Utility of locking in future price of fuel associated with the adoption of NEM.	Component includes the increases/decreases in administrative costs of any Utility's current fuel hedging program as a result of NEM adoption and the cost or benefit associated with serving a portion of its load with a resource that has less volatility due to fuel costs than certain fossil fuels. This value does not include commodity gains or losses and may currently be zero.
+/- Utility Integration & Interconnection Costs	Increase/reduction of costs borne by each Utility to interconnect and integrate NEM.	Costs can be determined most easily by detailed studies and/or literature reviews that have examined the costs of integration and interconnection associated with the adoption of NEM. Appropriate levels of photovoltaic penetration increases in South Carolina should be included.

# Component Description

Methodology Component	Description	Calculation Methodology/Value
+/- Utility Administration Costs	Increase/reduction of costs borne by each Utility to administer NEM.	Component includes the incremental costs associated with net metering, such as hand billing of net metering customers and other administrative costs.
+/- Environmental Costs	Increase/reduction of environmental compliance and/or system costs to the Utility.	The environmental compliance and/or Utility system costs might be accounted for in the Avoided Energy component, but, if not, should be accounted for separately. The Avoided Energy component must specify if these are included. These environmental compliance and/ or Utility system costs must be quantifiable and not based on estimates.



Thank You

# Discussion

# Economic Impact

Tyson Grinstead  
Director, Public Policy  
Sunrun

# Economic Impact

- 58-20-40 (D)(4):
  - “The direct and indirect economic impact of the net energy metering program to the State”
    - Who has done this before?
    - What did the legislature intend?
    - What is the best way to handle this variable?
      - How many jobs have been created?
      - How much income reinvested in the local economy?
      - How much tax revenue has been generated?

# What should be included?

- Direct
  - Purchasing local goods, services, property, labor. *For example, wages paid to solar installers, sales taxes, or property purchased for a warehouse.*
- Indirect
  - Goods purchased in order to do business or as a result of doing business. *For example, solar panels, trucks, advertising, goods purchased by solar employees with wages, property taxes.*

# Successor Tariffs and Rate Design

Lon Huber, VP Rate Design and Strategic Solutions

April 23, 2020

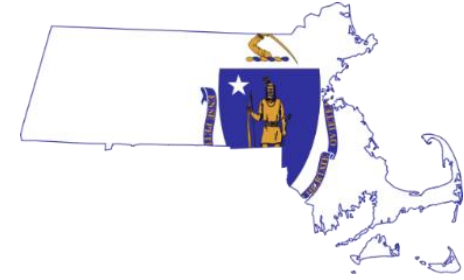


# Agenda

- NEM 2.0 Trends
- Successor Tariffs and Rate Design
- Act 62 Tariff
- Innovative Solutions

## Red, Purple and Blue States – Beyond NEM 1.0

- Nevada
- Maine
- Massachusetts
- Connecticut
- Indiana
- California
- Michigan
- Hawaii
- New Hampshire
- Utah
- Louisiana
- Arizona



## NEM 1.0 Augments & Alternatives – Tools in the Toolbox

- Standby Charges
- Value of Solar Rate
- Feed-in Tariffs
- Grid Access Charge
- Net Billing
- Buy-all, Sell-all
- Higher Customer Charge
- Non-bypassables
- Demand Charges
- Separate Rate Class
- Time of Use (TOU) Rates
- V-DER Tariffs
- Least Cost Procurement
- Community Solar
- Load Factor Adjuster
- Minimum Bill





# Primary Paths Away from NEM 1.0

	Fixed charge -or- Non-bypassable	Three-part rate -or- Time-of-use	Avoided cost -or- Proxy-based	Example Jurisdiction
<b>Retail Rate Offset</b>	<b>X</b>	<b>X</b>	<b>N/A</b>	APS (2013) CA (2016) MA (2016)
<b>Net Billing</b>	<b>X</b>	<b>X</b>	<b>X</b>	Hawaii (2015) AZ (2016) New York (2017) Michigan (2018)
<b>Outside of Retail Rate</b>	<b>X</b>	<b>X</b>	<b>X</b>	Austin (2012) TEP (2018) Maine (2017) CT (2018)

## ■ Retail Rate Offset

- Customers are credited for self-consumption and exports at the same rate according to the underlying retail tariff. However, additional charges including grid access fees and non-bypassable charges are applied.

## ■ Net billing & Export Differential

- Customers are credited for excess solar exported to the grid at a monetary rate that can be different (lower) than the self-consumption offset rate.
- In the extreme – no credit or an export ban.

## ■ Outside of Retail Rate

- Compensation based on production of the PV system at a rate decoupled from a customer's underlying retail rate – typically a “buy-all, sell-all” arrangement.

# Net Billing/Export Differential Flavors

- Monthly netting

- New Hampshire 2017
- Nevada 2017
- Indiana 2018

- Hourly netting

- New York 2017 (V-DER)

- Sub-hourly netting

- Utah (15 min) 2017

- Real time netting

- Arizona 2016
- Hawaii 2015
- Michigan 2018
- Louisiana 2019

- Export value step-downs have been utilized in AZ, NY and NV



\*Assuming a material spread between the retail rate and the export rate

Source: Adapted from *Lon Huber - Navigant*

# Arizona Overview

## ■ Net Billing

- Arizona Corporation Commission passed Net Billing in December 2016
- **Real-time netting**

## ■ Export Differential

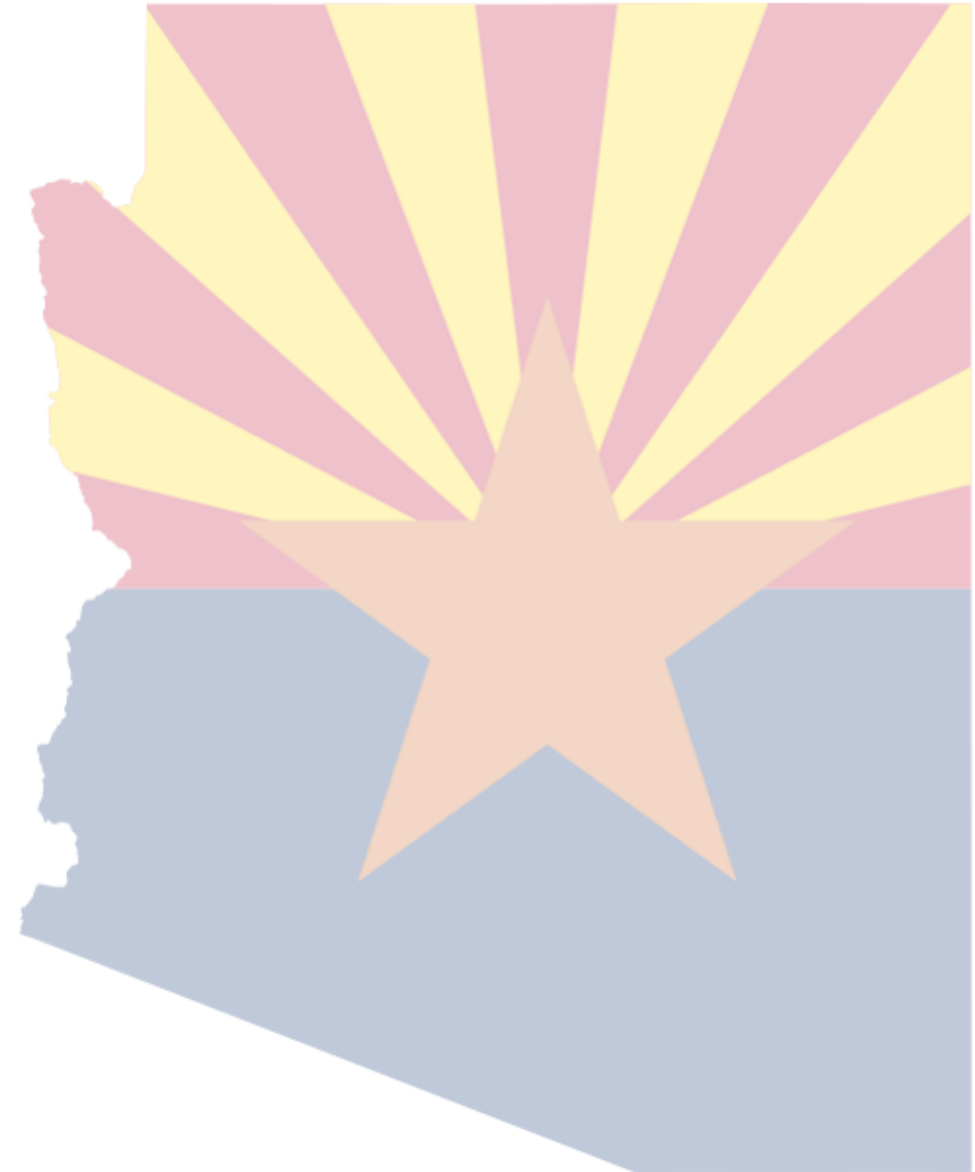
- Utility's exported energy rate to be decided in each rate case using avoided cost methodology or resource comparison proxy (RCP)
- Locked in for 10 years
- **Currently using RCP – Rolling 5-year weighted average of utility-scale portfolio price.**
- Limited to 10% reduction per year
- Recovered through Fuel Adjustor and Renewable Tariff

## ■ Separate rate class

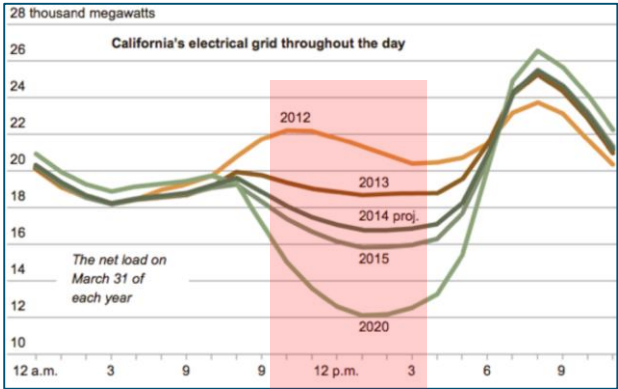
- **Mandatory TOU**
- Self consumption rate determined by cost of service study

## ■ Grid Access Fee

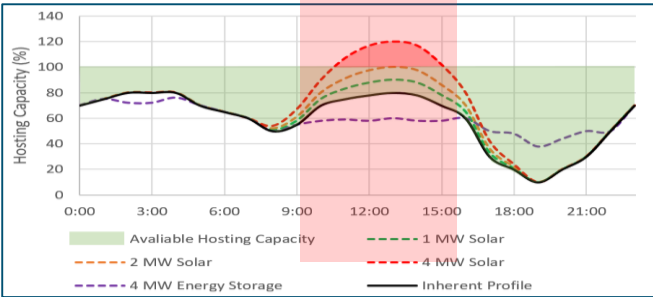
- Based on capacity of DG system



- Smart Export
  - No export compensation during mid-day
- Grid Supply Plus
  - Real time netting
  - Export compensation at avoided cost but remote curtailment enablement
- New inverter and interconnect standards:
  - Voltage and Frequency Ride-Through to improve power system stability
  - Frequency-watt (for over frequency only at this stage) to improve frequency stability
  - Volt-var function to resolve and reduce voltage constraints
  - Volt-watt function is defined but currently not activated until further studies into curtailment effects are undertaken

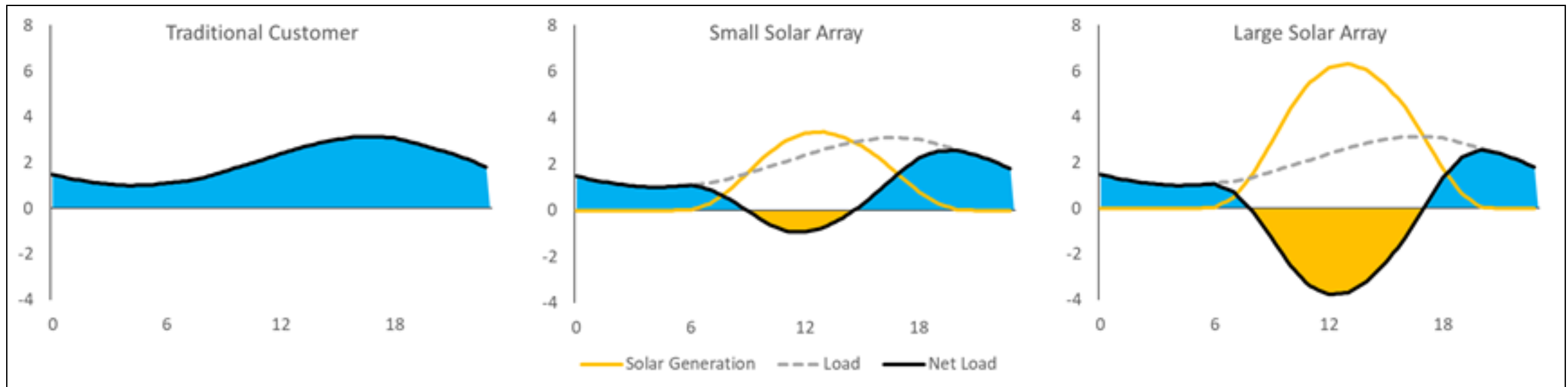


Credit Rates and Export Windows for Interim Smart Export Program for the HECO Companies				
12 a.m. – 9 a.m.		9 a.m. – 4 p.m.	4 p.m. – 12 a.m.	
O'ahu	14.97 ¢/kWh	No credit	14.97 ¢/kWh	
Hawai'i Island	11.00 ¢/kWh		11.00 ¢/kWh	
Maui	14.41 ¢/kWh		14.41 ¢/kWh	
Moloka'i	16.64 ¢/kWh		16.64 ¢/kWh	
Lāna'i	20.79 ¢/kWh		20.79 ¢/kWh	
The export credit rates will remain fixed for five (5) years.				



Source: Adapted from Lon Huber -  
Strategen

- Net Billing
  - Real time netting
  - Monetary credit for all exports at avoided cost plus potential adders
- Self-consumption
  - Standard rate



- Comprehensive approach
  - Solar Choice
    - Ensure fair and timely recovery of shared infrastructure and program costs
    - Manage excess exports closer to actual system use
  - Energy Efficiency and Demand Response
    - Time of use rates with dynamic and/or demand price signals
    - Align offering to power system need to ensure fair compensation to solar customers commensurate with system benefits for all customers
  - Bundling Opportunity - Think “solar +”
    - Incorporate additional technology

Thank You

# Discussion

## Next Steps – Leigh Ford



**Thank you! Be safe!**

**Net Energy Metering Stakeholder Meeting**  
**April 23, 2020, 10:00 am – 12:00 pm**  
**Remotely via GlobalMeet**

**Welcome:**

Jacob Colley of Duke Energy welcomed stakeholder participants, explained how the meeting would be conducted, and provided a safety briefing regarding safe workspaces.

**March 12, 2020 Meeting Minutes:**

Leigh Ford offered a final opportunity for any edits to the March 12, 2020 meeting minutes. There were no edits so the minutes are approved as submitted.

**Calculating the Value of DER:**

Jason Martin of Duke Energy discussed the value of DER according to Act 236 NEM DER Methodology and included explanations of all the cost/benefit categories.

Tyson Grinstead of Sunrun discussed potential direct and indirect economic impacts of NEM to the State and that South Carolina is the first state to consider these impacts. Tyson explained that direct impacts may include local goods and services, wages paid to solar installers, sales tax on panels, property purchased for a warehouse, and the daily things that are needed to run a solar business. Indirect impacts could include goods that are purchased to do business, such as solar panels, vehicles, advertising, goods purchased by solar employees, property taxes, and office.

The group discussed existing studies or tools, such as NREL, REMI, or IMPLAN, that could be considered when evaluating direct and indirect impacts. There was discussion on the definition of direct, indirect, and local benefits. Questions were asked as to the best way for these to be defined and several parties deferred to economic modeling. Tom Beach provided an analysis, "The Benefits and Costs of Distributed Solar Generation in New Hampshire" (attached) for the group's review/consideration.

**Successor Tariff and Rate Design**

Lon Huber of Duke Energy presented on net metering trends, ways other states have developed successor tariffs, other concepts for successor tariffs, and potential successor tariffs/rate designs. Specifically, Lon discussed developing tariffs that send price signals and the potential for a creative and wholistic approach for solar choice metering. Such examples include coupling solar with dispatchable/controllable devices, such as smart thermostats, batteries, etc.

Several participants expressed support for a creative and wholistic approach and providing customers choices.

**Wrap Up and Next Steps**

Leigh Ford will send the group the slides and meeting minutes. Duke will start reaching out with the stakeholders to discuss next steps and proposed tariffs.

**Attendees:**

<u>Attendee</u>	<u>Organization</u>
Tom Beach	Crossborder Energy
Sharad Bharadwaj	E3
Kullen Boling	Central Electric Power Cooperative
Robert Branton	Santee Cooper
Daniel Brookshire	NC Sustainable Energy Association
George Brown	Duke Energy
John Calhoun	Santee Cooper
George Cavros	Southern Alliance for Clean Energy
Maggie Clark	SEIA
Jacob Colley	Duke Energy
Ashley Cooper	Parker Poe
Thad Culley	Vote Solar
Tom Delello	Gregory Electric
Nanette Edwards	ORS
Margot Everett	Navigent
Leigh Ford	Duke Energy
Tyson Grinstead	Sunrun
Carrie Grundmann	Walmart
Karen Hall	Duke Energy
Dana Harrington	Duke Energy
Dawn Hipp	ORS
Lon Huber	Duke Energy
Maia Hutt	Southern Environmental Law Center
Bryan Jacob	Southern Alliance for Clean Energy
Alex Knowles	ORS
Robert Lawyer	ORS
Peter Ledford	NC Sustainable Energy Association
Kate Lee	Southern Environmental Law Center
Jason Martin	Duke Energy
Lyndsey McNeely	Duke Energy
Eddy Moore	SC Coastal Conservation League
O'Neil Morgan	ORS
David Neal	Southern Environmental Law Center
Justin Orkney	Duke Energy
Lisa Perry	Walmart
Gretchen Pool	ORS
Marcus Preston	Duke Energy
Cole Price	Central Electric Power Cooperative
Jim Rabon	Santee Cooper
Shelley Robbins	Upstate Forever
John Rouff	AARP
Ben Smith	NC Sustainable Energy Association
Kim Smith	Duke Energy
Mark Svrcek	Central Electric Power Cooperative
Ryder Thompson	ORS
Neal Williams	Lockhart Power
Bruce Wood	Sunstore



Heather Shirley Smith  
Deputy General Counsel

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f: 864.370.5183

heather.smith@duke-energy.com

September 21, 2020

**VIA ELECTRONIC FILING**

The Honorable Jocelyn G. Boyd  
Chief Clerk/Executive Director  
Public Service Commission of South Carolina  
101 Executive Center Drive, Suite 100  
Columbia SC 29210

**Re: Duke Energy Progress, LLC's Establishment of Net Energy Metering Tariff  
in Compliance with H. 3659 and Duke Energy Carolinas, LLC's Establishment  
of Net Energy Metering Tariff in Compliance with H. 3659  
Docket Number: 2019-169-E & 2019-170-E**

Dear Ms. Boyd:

Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP" and, together with DEC, the "Companies") are hereby providing the Commission with an update regarding the status of their collaboration with stakeholders on the issues at hand in the above-referenced dockets. On September 16, 2020, the Companies, along with the North Carolina Sustainable Energy Association, Sunrun Inc., Vote Solar, and the Southern Environmental Law Center on behalf of South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Upstate Forever (collectively the "Parties to the Agreement") issued a press release in which they announced an agreement regarding the Companies' planned Solar Choice Metering tariff filing. A copy of the September 16, 2020 press release is enclosed.

The agreement between the parties builds on the goals of Act 62 and, if approved by the Commission, will provide options for customers while allowing the Companies to address increasing electric demand periods in the winter for the benefit of the Companies' systems and customers.

The agreement includes retail rates that vary based on the time of day and when utilities experience peak demand and it includes incentives for participation in a proposed demand response program that pairs the installation of smart thermostats with solar installation. The proposed rate design will send customers improved price signals to reduce consumption when power prices are high and will allow solar customers to maximize the value of self-consumption. When paired with a minimum bill, grid access fee for unusually large systems, and non-bypassable charges as explained below, the cost of public programs and the grid will be covered without imposing costs on non-solar customers, thereby minimizing any cost-shift in compliance with Act 62.

The Honorable Jocelyn G. Boyd  
September 21, 2020  
Page 2

The agreement also contains a grandfathering provision to protect current net energy metering customers and, if approved by this Commission, the Companies anticipate a transitional tariff will be available on June 1, 2021, to allow for a full transition into the new Solar Choice Metering Tariffs on or before January 1, 2022. While the Companies and the Parties to the Agreement plan on advancing the agreement with stakeholders and incorporating any appropriate additional changes or input from stakeholders prior to the November 2<sup>nd</sup> filing, the Companies and Parties to the Agreement are fully cognizant that any agreement must be considered by this Commission. The Companies also note that certain components will require approval from the North Carolina Utilities Commission as well.

Additional details about the agreement are listed below:

**Interim Tariff:**

- An interim tariff in which residential customers applying from June 1, 2021 through December 31, 2021 would remain on their existing rate schedule and be placed on a new net metering rider, which will include monthly netting with net excess energy applied as a bill credit at avoided cost and certain non-bypassable charges until May 31, 2029.

**Solar Choice Metering Tariff:**

- The Solar Choice Metering tariff will apply to all interested residential customers applying on or after January 1, 2022.
- A minimum monthly bill of \$30.00 for each Solar Choice Metering customer will be assessed to recover estimated customer and distribution costs. The minimum monthly bill is reduced by the basic facilities charge (“BFC”) and the portion of the customer’s monthly volumetric energy charges specific to customer and distribution costs.
- Proposed critical peak pricing (“CPP”) and time-of-use (“TOU”) rates as follows:

	Prices without Riders and before future fuel cost adjustments (c/kWh)	
	DEC SC	DEP SC
Peak	15.4444	16.140
Off-Peak	9.0270	9.805
Super-Off-Peak	6.2952	7.294
Critical Peak*	25	25

\* Price for peak hours on up to 20 Company-designated Critical Price days per year

- Annual on-peak periods would be from 6:00 pm – 9:00 pm (Eastern Prevailing Time), with additional on-peak periods during the months of December-February from 6:00 am – 9:00 am. The super-off-peak period would be from March-November from 12:00 am – 6:00 am.

- The designation of critical peak pricing days and hours would be set daily and posted on the Companies' website as the official customer notification, along with other possible means of notification.
- A monthly grid access fee for facilities with capacity in excess of 15 kW-dc. The proposed grid access fee is \$5.86/kW - dc/month for DEC and \$3.95/kW - dc/month for DEP (if approved), applied to the nameplate capacity in excess of 15 kW-dc.
- Inclusion of the Commission-approved BFC of \$13.09 for DEC and \$14.63 for DEP for customer electing to voluntarily subscribe to the Solar Choice Metering tariffs. The BFC would be used to reduce the customer's minimum bill.
- Customer's energy imports and exports would be netted within each TOU pricing tier and monthly net exports would be applied as a bill credit at avoided cost and this bill credit can be used to reduce a customer's bill after the minimum bill has been applied. CPP applies to all imports during the CPP hours. Any energy exports during the CPP hours will be netted against peak imports, not the Critical Peak imports.
- DSM/EE, storm cost recovery, and cyber security costs would be non-bypassable charges for Solar Choice Metering tariff customers.
- A \$0.36/Watt-dc incentive for new qualifying Solar Choice Metering tariff customers, which will be assignable to solar leasing companies. To receive this incentive, customers must enroll in the proposed winter smart thermostat program, which offers an additional upfront \$75 bill credit and then an annual bill credit of \$25. The cumulative impact of both incentives is \$0.39 cents/watt, if approved. This incentive will need to be approved in both South Carolina and North Carolina.
- To ensure broad technology inclusion, the Companies will work with stakeholders to identify other peak load reduction technologies that can be paired with solar in addition to the winter smart thermostat program. The minimum qualification is that the technology must lead to a reliable reduction of at least ~1 kW per hour during peak winter hours. The Companies commit to file such a program by June 1, 2022.
- A non-residential offering for customers applying for interconnection after June 1, 2021. These customers would be served under their existing tariff and the Solar Choice Metering rider, which would include monthly netting of excess energy that would be applied as a bill credit at avoided cost.

Although the agreement between the Companies and certain stakeholders was announced on September 16, nothing in the agreement will impact the schedule that has currently been set by the Commission for the Companies' Solar Choice tariff proceedings. The Companies and the other parties to the agreement plan to continue working through issues with other stakeholders in advance of the Companies' November 2, 2020 filings to this Commission. DEC and DEP are

The Honorable Jocelyn G. Boyd  
September 21, 2020  
Page 4

committed to continuing the cooperative spirit that has been a hallmark of these negotiations and hope to be able to present a comprehensive and collaborative filing for the Commission's consideration on November 2, 2020.

Sincerely,



Heather Shirley Smith

Enclosure

cc: Parties of record

## News Release

Duke Energy Media Contact: Ryan Mosier  
24-Hour: 800.559.3853

Vote Solar Media Contact: Hilary Lewis  
202.455.0361

Sept. 16, 2020

### **Duke Energy reaches deal with Vote Solar, Sunrun, renewable energy advocates to modernize, expand rooftop solar in South Carolina**

- **Deal will create innovative pricing and incentives for residential solar customers**
- **Plan is latest step in implementing bipartisan, collaborative path for growth of renewables in the Carolinas**

GREENVILLE, S.C. – Duke Energy today announced an agreement with leading solar installers, environmental groups and renewable energy advocates that, if approved by regulators, will create long-term stability for the residential solar industry in South Carolina.

The deal will provide options for customers while allowing the company to address increasing electric demand periods in the winter for the benefit of the company's systems and customers in both North Carolina and South Carolina.

The proposed plan – Solar Choice Net Metering – could be the next generation of net energy metering for the Carolinas, a billing process that credits small customers with rooftop solar arrays for excess electricity they generate and provide to Duke Energy via the grid.

Solar Choice Net Metering will include retail rates that vary based on the time of day and when utilities experience peak demand. It will also give customers the ability to install a smart thermostat with their solar panels and receive an incentive for the combination.

“This first-of-a-kind package completely modernizes the rooftop solar transaction,” said Lon Huber, Duke Energy’s vice president for rate design and strategic solutions. “This new arrangement not only recognizes the value of solar and the enabling energy grid, but it unlocks additional benefits for all customers by addressing when utilities experience peak demand across their systems in the Carolinas.”



Those organizations part of the effort include renewable energy advocates Vote Solar and North Carolina Sustainable Energy Association; the Southern Environmental Law Center on behalf of South Carolina Coastal Conservation League, Upstate Forever and Southern Alliance for Clean Energy; and leading rooftop solar installer Sunrun. Each organization that is part of the agreement will continue to advance the proposal to other stakeholders and ultimately regulators.

The agreement builds on the goals of the South Carolina Energy Freedom Act (Act 62). The 2019 legislation is the result of a collaborative and bipartisan effort to develop the next steps for energy policy in South Carolina that support the state's continued commitment to solar energy development.

"Collaboration brought us a pathway to growing renewables in the state with Act 62, and that spirit of working together created this plan for the continued expansion of solar in South Carolina," said Mike Callahan, Duke Energy South Carolina state president. "Duke Energy is committed to the cooperative spirit that has been a hallmark of achieving successful solar policy and creating a cleaner energy future for customers in South Carolina."

"Duke Energy deserves credit for its leadership in bringing stakeholders together, establishing trust through transparency, and embracing policy innovation," said Thad Culley, senior regional director for Vote Solar. "I am hopeful that this collaborative approach will encourage more partnerships with Duke Energy as we try to navigate our way toward a cleaner, more resilient grid, while providing additional choices for South Carolina families."

If approved by regulators, the company anticipates a transitional tariff to be available on June 1, 2021, to allow for a full transition into the new plan on or before Jan. 1, 2022.

## Duke Energy

Duke Energy (NYSE: DUK), a Fortune 150 company headquartered in Charlotte, N.C., is one of the largest energy holding companies in the U.S. It employs 29,000 people and has an electric generating capacity of 51,000 megawatts through its regulated utilities and 2,300 megawatts through its nonregulated Duke Energy Renewables unit.

Duke Energy is transforming its customers' experience, modernizing the energy grid, generating cleaner energy and expanding natural gas infrastructure to create a smarter energy future for the people and communities it serves. The Electric Utilities and Infrastructure unit's regulated utilities serve 7.8 million retail electric customers in six states: North Carolina, South Carolina, Florida, Indiana, Ohio and Kentucky. The Gas Utilities and Infrastructure unit distributes natural gas to 1.6 million customers in five

states: North Carolina, South Carolina, Tennessee, Ohio and Kentucky. The Duke Energy Renewables unit operates wind and solar generation facilities across the U.S., as well as energy storage and microgrid projects.

Duke Energy was named to Fortune's 2020 "World's Most Admired Companies" list and Forbes' "America's Best Employers" list. More information about the company is available at [duke-energy.com](https://www.duke-energy.com). The [Duke Energy News Center](#) contains news releases, fact sheets, photos, videos and other materials. Duke Energy's [illumination](#) features stories about people, innovations, community topics and environmental issues. Follow Duke Energy on [Twitter](#), [LinkedIn](#), [Instagram](#) and [Facebook](#).

###

**Net Energy Metering Stakeholder Meeting**  
**September 23, 2020, 10:00 am – 11:00 am**  
***Remotely via Teams Meeting***

**Agenda:**

**10:00 – 10:10**

**Welcome, Housekeeping, and Safety Briefing** – Leigh Ford  
**April 23, 2020 Meeting Minutes** – Leigh Ford

**10:10 – 10:30**

**Overview of Stakeholder Process & Tariff Development** – Lon Huber & George Brown  
**Settlement Agreement Terms** – Lon Huber & George Brown

**10:30 – 10:50**

**Discussion/Feedback**

**10:50 – 11:00**

**Wrap Up and Next Steps** – Leigh Ford

## Executive Summary

Updated: Sept. 21, 2020

### Solar Choice Net Metering

#### **Background**

In early 2020, Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC (“DEP” and together with DEC, the “Companies”) facilitated stakeholder workshops to solicit feedback and input to be used in the development of the next generation of net energy metering (“NEM”) in South Carolina under Energy Freedom Act, S.C. Act No. 62 of 2019 (“Act 62”). Specifically, Act 62 requires the Companies to develop and propose a successor tariff to the current NEM rider for customers adopting solar after June 1, 2021.

As a result of these meetings and other collaborative stakeholder engagement, the Companies reached an agreement on a proposed successor tariff that will fulfill the spirit of Act 62 by (i) building upon the Companies’ current NEM programs in a way that benefits the Companies and their customers and (ii) furthering the goal of a clean energy future in South Carolina. The parties to the agreement include the Companies; Vote Solar; North Carolina Sustainable Energy Association; Sunrun Inc.; and the Southern Environmental Law Center on behalf of South Carolina Coastal Conservation League, Upstate Forever, and Southern Alliance for Clean Energy. Each organization that is part of the agreement will continue to advance the proposed successor tariff to other stakeholders, with the ultimate goal of obtaining approval from the Public Service Commission of South Carolina and the North Carolina Utilities Commission, as appropriate, to implement the successor tariff.

#### **Highlights**

##### **Interim Tariff**

- Between June 1, 2021 and December 31, 2021, new residential solar customers will remain on their existing rate schedule.
- The Interim Tariff will include monthly netting with net excess energy applied as a bill credit at avoided cost and certain non-bypassable charges (DSM/EE, storm cost recovery, and cyber security costs).
- Customers may remain on the Interim Tariff until May 31, 2029.
- There will be a monthly cap on Interim Tariff applications (1.2 MW for DEC and 300 kW for DEP).

## Executive Summary

### Tariff

- The Solar Choice Metering Tariff will apply to residential solar PV customers applying on or after January 1, 2022.
- Includes Critical Peak Pricing (“CPP”) time-of-use (“TOU”) rates as follows:

	Prices without Riders and before future fuel cost adjustments (c/kWh)	
	DEC SC	DEP SC
Peak	15.4444	16.140
Off-Peak	9.0270	9.805
Super-Off-Peak	6.2952	7.294
Critical Peak*	25	25

\* Price for peak hours on up to 20 Company-designated Critical Price days per year

- Annual on-peak periods would be from 6:00 pm – 9:00 pm (Eastern Prevailing Time), with additional on-peak periods during the months of December-February from 6:00 am – 9:00 am. The super-off-peak period would be from March-November from 12:00 am – 6:00 am.
- Customer’s energy imports and exports would be netted within each TOU pricing period and monthly net exports would be applied as a bill credit at avoided cost, and this bill credit can be used to reduce a customer’s bill after the minimum bill has been applied. CPP applies to all imports during the CPP hours. Any energy exports during the CPP hours will be netted against peak imports, not the Critical Peak imports.
- A minimum monthly bill of \$30.00 for each Solar Choice Metering customer will be assessed to recover estimated customer and distribution costs. The minimum monthly bill is reduced by the basic facilities charge (\$13.09 for DEC and \$14.63 for DEP) and the portion of the customer’s monthly volumetric energy charges specific to customer and distribution costs.
- A monthly grid access fee (“GAF”) for facilities with capacity in excess of 15 kW-dc. The proposed GAF is \$5.86/kW - dc/month for DEC and \$3.95/kW - dc/month for DEP (if approved), applied to the nameplate capacity in excess of 15 kW-dc.
- DSM/EE, storm cost recovery, and cyber security costs would be non-bypassable charges for Solar Choice Metering tariff customers.

## Executive Summary

### DSM/EE Incentives

- A \$0.36/Watt-dc incentive for new qualifying Solar Choice Metering tariff customers, which will be assignable to solar leasing companies. To receive this incentive, customers must enroll in the proposed winter smart thermostat program, which offers an additional upfront \$75 bill credit and then an annual bill credit of \$25. The cumulative impact of both incentives is \$0.39 cents/watt, if approved.
- The DSM/EE incentives must be approved by both the PSCSC and the NCUC in order to be offered by the Companies.
- To ensure broad technology inclusion, the Companies will work with stakeholders to identify other peak load reduction technologies that can be paired with solar in addition to the winter smart thermostat program. The minimum qualification is that the technology must lead to a reliable reduction of at least ~1 kW per hour during peak winter hours. The Companies commit to file such a program by June 1, 2022.
- The Companies would explore a Solar Choice program tailored to low-income customers as a potential future energy efficiency (“EE”) or demand response program, in consultation with stakeholders.

### Non-residential Tariff

- Non-residential customers applying for interconnection after June 1, 2021 would be served under their existing tariff and the Solar Choice Metering rider.
- The Solar Choice Metering rider would include monthly netting of excess energy that would be applied as a bill credit at avoided cost.
- Customer generators with systems less than 30 kW may be transitioned to a mandatory TOU rate and, prior to filing, Duke would work with interested stakeholders to develop a plan for this transition.

## Executive Summary

### Current Net Energy Metering (NEM) Tariff

- At the current NEM customer's transfer year (2025 for NEM customers under Act 236 and 2029 Solar Choice Program customers under Act 62), existing NEM solar customers would be given the option to switch to the Permanent Solar Choice Tariffs.
- At their transfer year, current NEM customers who do not want to switch to the Permanent Solar Choice Tariffs can choose to remain on the standard residential tariff with the following modifications: volumetric price increase after the transfer year would be placed in a non-bypassable charge for the remaining life of the system; the tariff would include net excess energy being applied as a bill credit at avoided cost; and the assessment of a minimum bill set at \$10 more than the approved BFC at that time.

###



# Proposed Settlement for DEC/DEP in SC

*Solar Choice Metering Tariffs*

September 2020





# Agenda

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1. Welcome & Safety Briefing
2. Overview of Stakeholder Process & Tariff Development
3. Settlement Agreement Terms
4. Discussion/Feedback
5. Next Steps

# Overview of Stakeholder Process & Tariff Development

1. Broad Stakeholder Process
2. Collaborative Discussions, Negotiations, and Data Sharing with Key Interested Parties on Tariffs
3. Ready to Advance a Proposed Solar Choice Tariff that:
  - Addresses subsidization consistent with Act 62;
  - Incorporates best practices and lessons learned from other jurisdictions;
  - Forms a scalable long-term framework;
  - Avoids a contentious battle by achieving a proposed comprehensive settlement; and
  - Promotes a clean energy future for South Carolina and North Carolina.

# The Task

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## Ensure the Solar Choice Offering:

• Includes additional mitigation measures to transition existing customer-generators.	58-40-20 (F) 3 (c)
• Avoids disruption to the growing market for customer-scale distributed energy resources.	58-40-20 (A) 2
• Fairly allocates costs and benefits to eliminate cost shift or subsidization associated with net metering to the greatest extent practicable.	58-40-20 (A) 3
• Considers the interaction of the tariff with time-variant rate schedules available to customer-generators and whether different measurement intervals are justified for customer-generators taking service on a time-variant rate schedule.	58-40-20 (F) 3 (b)
• Establishes a methodology for calculating the value of the energy produced by customer-generators.	58-40-20 (C) (2)
• Provides opportunities for customer measures to reduce or manage electrical consumption from electrical utilities in a manner that contributes to reductions in utility peak electrical demand and other drivers of electrical utility costs	58-27-845 (B)

# Settlement Agreement Terms

# Settlement Agreement Parties

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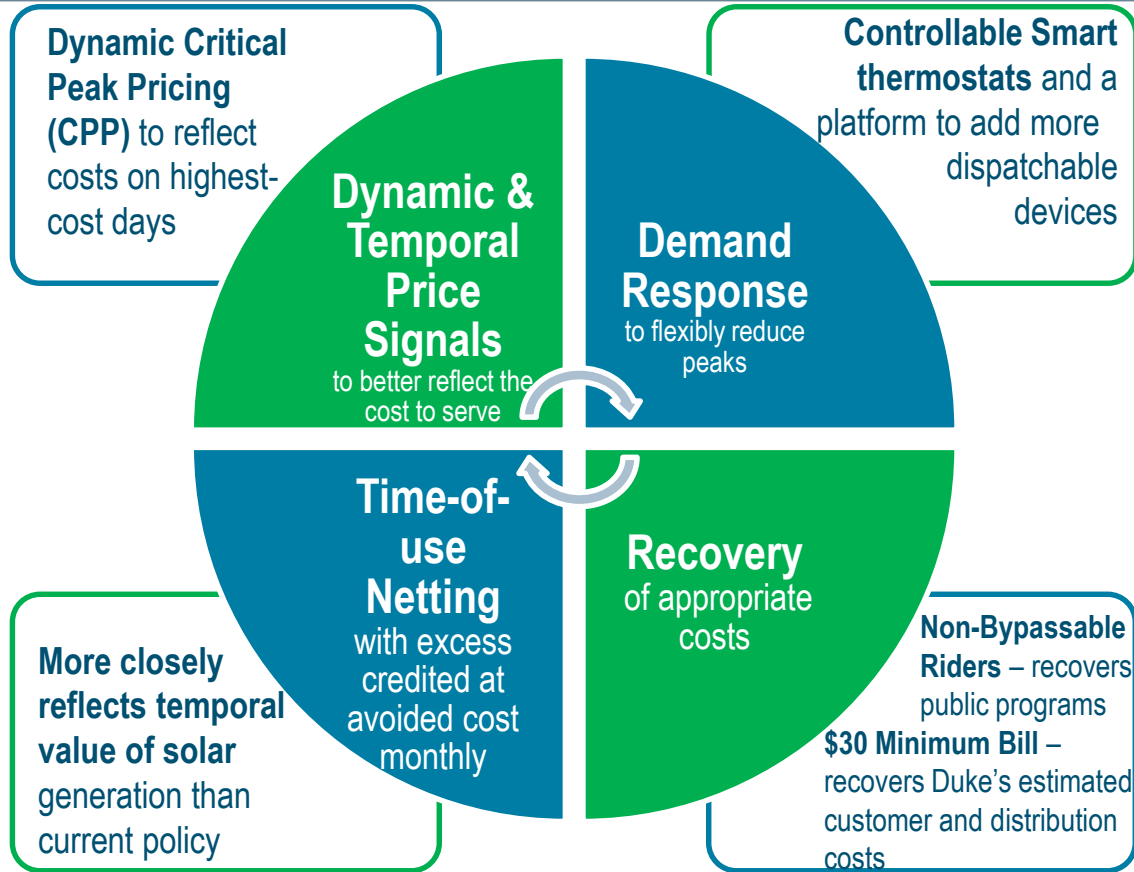
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## Parties:

- Duke Energy Carolinas & Duke Energy Progress
- Vote Solar
- North Carolina Sustainable Energy Association
- Sunrun Inc.
- Southern Environmental Law Center on behalf of:
  - South Carolina Coastal Conservation League
  - Upstate Forever
  - Southern Alliance for Clean Energy

# Key Elements of the Proposed Settlement

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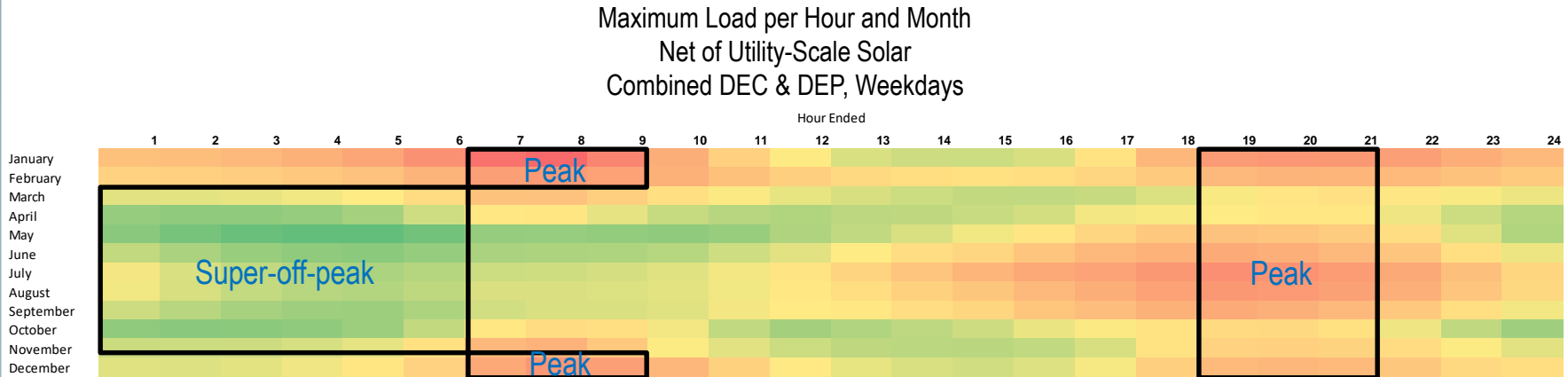


# Refreshing TOU Periods

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- Updated TOU Periods to target highest cost and loss of load risk hours
- Utilized forecasts for 2025 to ensure design is ahead of the curve
- Shorter 3-hour peak periods enable customers to better respond to price signals
- Aligns DEC and DEP TOU periods





# Time of Use and Dynamic Prices

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	Price w/o Riders* (c/kWh)	
	DEC	DEP
Peak	15.4444	16.140
Off-Peak	9.0270	9.805
Super-Off-Peak	6.2952	7.294
Critical Peak	25	25

\*includes fuel as included in the 2017 COSS

# Non-Participant Protections

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## Address Potential Cost Shifting to Non-Participants

TOU & CPP



✓ Inter- and Intra-day arbitrage between high- and low-cost periods

Grid Access Fee



✓ Very large system sizes

Monthly Netting



✓ Seasonal Arbitrage

Non-Bypassables



✓ Non-collection of Public Benefit Costs

\$30 Minimum Bill



✓ Non-collection of Customer and Some Distribution Costs

# Settlement Agreement Terms

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## Non-Residential Customers:

- Solar Choice Metering Rider w/ Monthly Excess at Avoided Cost

## Existing NEM Customers:

- Solar Choice Metering Tariff or Remain on Existing
- Non-Bypassable Volumetric Charges (higher if remain on existing)
- Monthly Excess at Avoided Cost
- Minimum Bill \$10 greater than BFC

## Misc. Terms:

- Low-Income
- Additional Peak Load Reduction Technologies

# Estimating the Cost Shift

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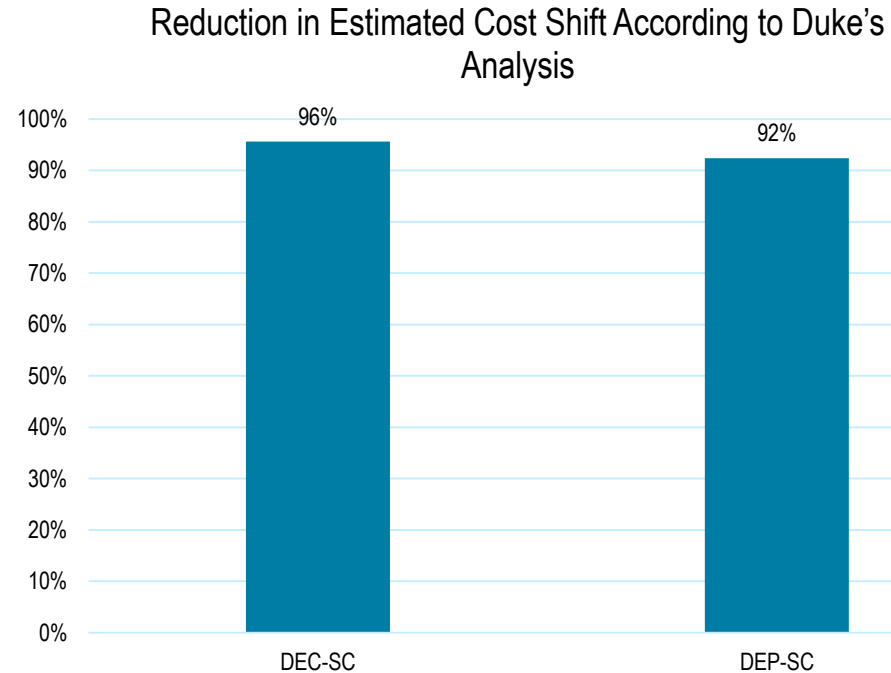
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- Act 62 provides guidance on how to calculate the any estimated cost shift
  - Requires an evaluation of whether customer generators provide an adequate rate of return compared to the otherwise applicable rate class
  - A cross-subsidy exists if additional costs need to be allocated to a theoretical NEM rate class
- The Company created a new study in compliance with Act 62
- This study is a point-in-time cost of service estimate which gauges parity with the rest of the non-NEM residential class in South Carolina
- The draft study found that the current NEM structure with currently sized systems results in a monthly cost shift of \$35-\$40 DEC-SC and DEP-SC

# Impact on Over Compensation - Duke's Analysis

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- According to Duke's analysis, policy results in a 96%-92% reduction in estimated cost shift
- Duke's estimate of subsidy in accordance with Act 62's requirement to analyze NEM customers as if they were a separate rate class
- Represents a snapshot in time that does not include solar benefits outside the ratemaking process



# Introducing Solar +

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- Enables synergistic system benefits by linking solar to controllable peak demand reducing devices – with a focus on winter peak

- Smart thermostats



- Battery storage (future state)



- Other connectable devices that bring a reliable reduction of at least 1 kW

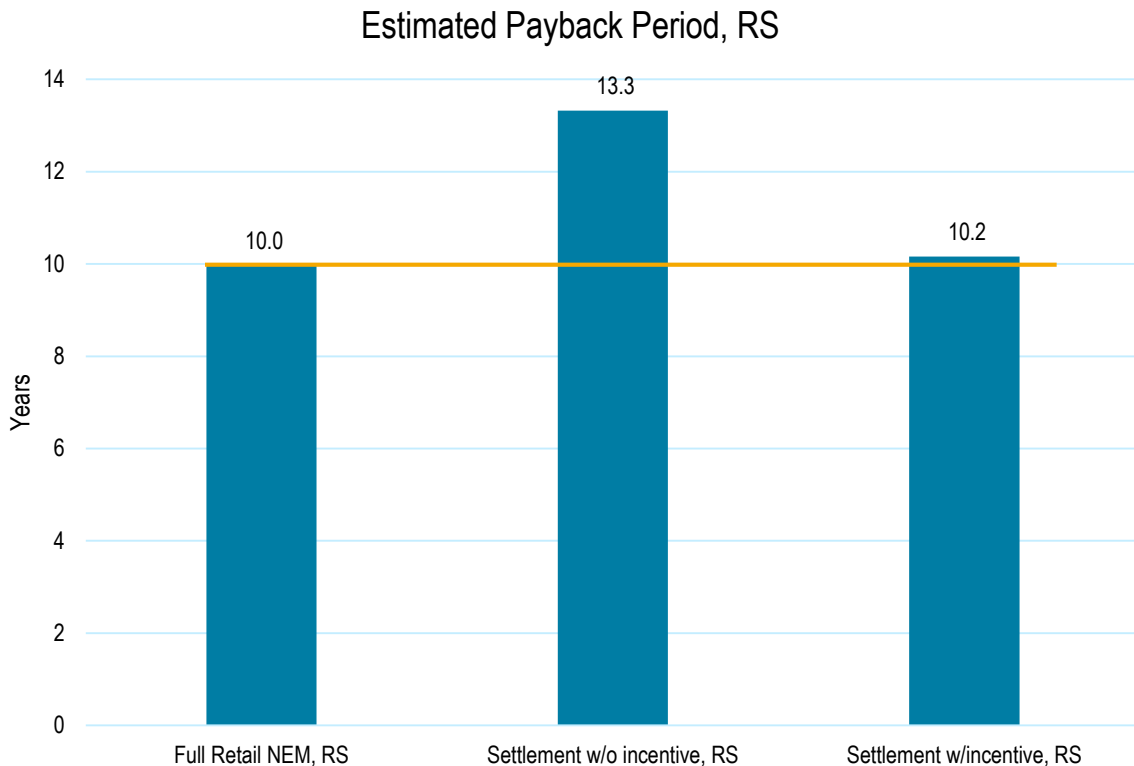


- When eligible devices are paired with Solar, the adopter becomes qualified for an EE incentive of ~\$0.36/Watt

- Solar reduces system energy needs + DR reduces system capacity needs = Comprehensive System Benefit
- Must pass cost effectiveness tests
- Incurs same treatment as today's EE measures

# Estimated Payback Period, DEC-SC

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*This analysis is for illustrative purposes only and the actual payback could vary significantly from these estimates.*

## Notes

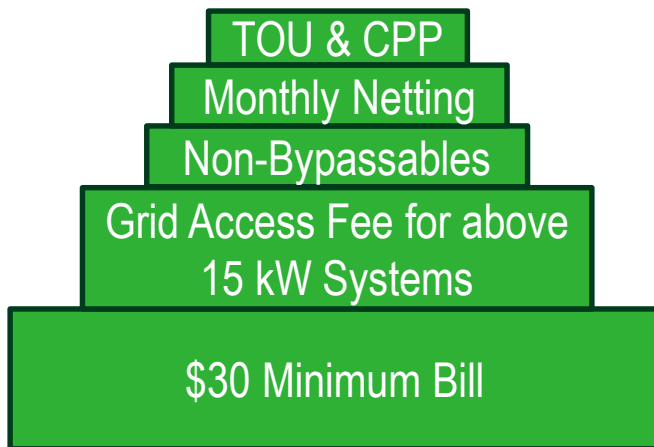
- No discounting
- Assumed constant cost/kW-AC for developer
- Assumed 30% federal ITC, 25% state ITC
- RS average system size is 8.7 kW-ac
- RE average system size is 10.2 kW-ac
- Assumed majority of RE NEM customers take incentive
- No adjustment for smaller optimum system size or customer response to price signals

# How the Elements Come Together

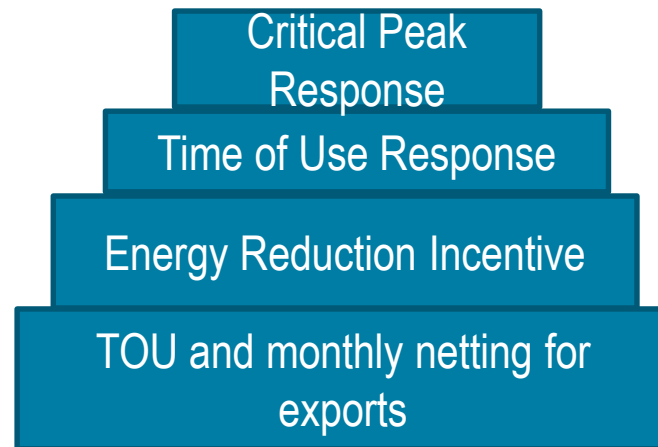
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## Financial Protections for Non-Participants



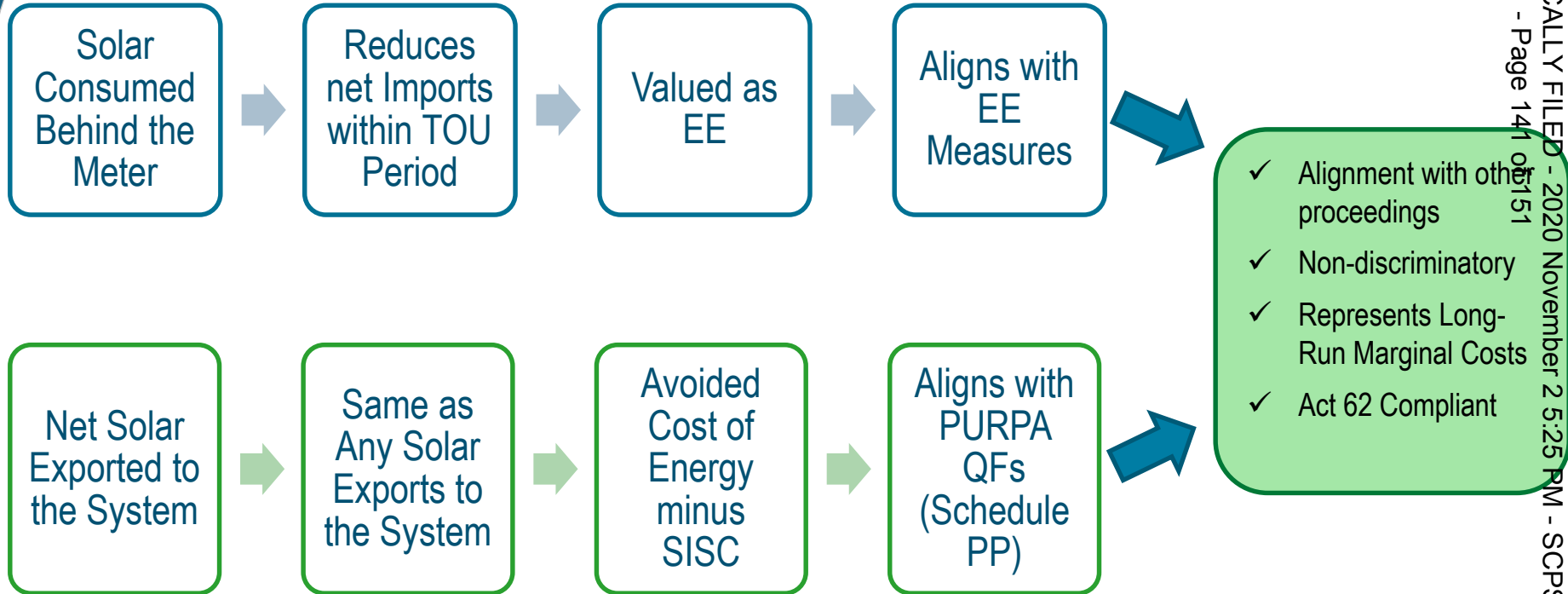
## Value Streams for Solar Adopters





# Value of Solar

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# Transition For Existing Customers

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- At their transfer year (2025 Act 236, 2029 Act 62), existing NEM solar customers will be given the option to switch to the CPP TOU rate.
  
- If they elect not to be on that rate:
  - They can stay on the standard residential tariff but any volumetric price increase after their transfer year will be placed in a non-bypassable, non-volumetric charge based on their system size for the remaining life of the system.
  - This will also include monthly netting with net excess energy credited at the avoided cost rate.
  - The solar customer will also be assessed a minimum bill set at \$10 more than the Basic Facilities Charge at that time.

# Proposed Bridge Rate

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Interim Rate June 1, 2021 to January 1, 2022

- New Net Metering Tariff will have:
  - Monthly Netting with net Excess credited at Avoided Cost
  - Non-Bypassable Rider Charge
- Customers will remain on existing rate schedule
- Minimum bill of \$10 more than the BFC
- Cap of 1.2 MW for DEC, 300 kW for DEP per month

Why

- Billing constraints
- Complexity of introducing CPP mid-year

# Score Card – Act 62 Goals

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✓	Includes additional mitigation measures to transition existing customer-generators.	58-40-20 (F) 3 (c)
✓	Avoids disruption to the growing market for customer-scale distributed energy resources.	58-40-20 (A) 2
✓	Fairly allocates costs and benefits to eliminate any cost shift or subsidization associated with net metering to the greatest extent practicable.	58-40-20 (A) 3
✓	Considers the interaction of the tariff with time-variant rate schedules available to customer-generators and whether different measurement intervals are justified for customer-generators taking service on a time-variant rate schedule.	58-40-20 (F) 3 (b)
✓	Establishes a methodology for calculating the value of the energy produced by customer-generators.	58-40-20 (C) (2)
✓	Provide opportunities for customer measures to reduce or manage electrical consumption from electrical utilities in a manner that contributes to reductions in utility peak electrical demand and other drivers of electrical utility costs	58-27- 845(B)

# Discussion/Feedback

# Next Steps

## Next Steps

1. Generic Docket – October 8
2. Tariff Filing – November 2
3. DSM/EE Filing (BYOT) – October 2
4. DSM/EE Filing (Solar EE) – TBD
5. Other Regulatory Filings – TBD





**Net Energy Metering Stakeholder Meeting**  
**September 23, 2020, 10:00 am – 11:00 am**  
**Remotely via Microsoft Teams**

**Welcome:**

Leigh Ford of Duke Energy welcomed stakeholder participants, explained how the meeting would be conducted, and provided a safety briefing regarding safe workspaces.

**April 23, 2020 Meeting Minutes:**

Leigh Ford offered a final opportunity for any edits to the April 23, 2020 meeting minutes. There were no edits so the minutes are approved as submitted.

**Overview of Stakeholder Process and Tariff Development:**

George Brown of Duke Energy discussed the initial broad stakeholder discussions that were that led to the creation of the settlement proposal. George explained that the intent of the Company and the stakeholders was to formulate a settlement that would fulfill the requirements of Act 62 and provide the solar industry a viable path forward.

Lon Huber of Duke Energy provided a discussion on the settlement proposal. He noted that, along with Duke Energy Carolinas and Duke Energy Progress, the parties to the settlement agreement are the Southern Environmental Law Center (on behalf of South Carolina Coastal Conservation League, Southern Alliance for Clean Energy, and Upstate Forever), Sunrun Inc, Vote Solar, and the North Carolina Sustainable Energy Association.

**Settlement Agreement Terms:**

Lon Huber of Duke Energy provided a detailed description of the terms of the proposed settlement, which are included in the attached presentation. For residential customers these elements include time of use rates with critical peak pricing, a monthly minimum bill, non-bypassable charges, a grid access fee, and monthly netting. The Company will work toward a future low-income offering.

George Brown explained that while Duke Energy is implementing and testing its new billing system no new tariffs can be added so Duke is proposing to implement the permanent residential TOU rate structure until the billing system implementation is complete. Therefore, the proposed settlement includes an interim tariff to bridge the gap from when Act 62 requires net Solar Choice metering tariffs and when the Companies' billing system can accept new tariffs. There monthly capacity caps for the interim tariff are 1.2 MW for DEC and 300 kW for DEP.

Non-residential customers can remain on their existing rate schedule and a new NEM rider that would have monthly netting with net excess credited at avoided cost. Duke plans to review the commercial rate designs as part of a company rate review that they expect to begin next year.

George Brown of Duke Energy discussed the grandfathering of the current NEM customers who energized their system under Act 236 (who will stay on the existing rate through 2025) and under Act 62 (who can stay on their rate until 2029).

**Discussion/Feedback:**

There was a roundtable discussion regarding the settlement agreement, proposed timelines, next steps, and future programs.

**Wrap Up and Next Steps:**

Leigh Ford outlined the upcoming regulatory filings and their expected timing. Leigh will send the group the slides and meeting minutes.

**Attendees:**

<u>Attendee</u>	<u>Organization</u>
John Becker	Central Electric Power Cooperative
Sharad Bharadwaj	E3
Robert Branton	Santee Cooper
Lauren Bowen	SELC
Daniel Brookshire	NC Sustainable Energy Association
George Brown	Duke Energy
John Calhoun	Santee Cooper
Jacob Colley	Duke Energy
Ashley Cooper	Parker Poe
Thad Culley	Vote Solar
Layla Cummings	NC Public Staff
Alicia Dasch	Duke Energy
Hilary Davidson	Duke Energy
Dianna Downey	NC Public Staff
Lucy Edmondson	NC Public Staff
Margot Everett	Navigent
Jack Floyd	NC Public Staff
Leigh Ford	Duke Energy
Mark Furtick	Dominion
Tyson Grinstead	Sunrun
Karen Hall	Duke Energy
Bradley Harris	Duke Energy
Dana Harrington	Duke Energy
Bob Hinton	NC Public Staff
Dawn Hipp	ORS
Lon Huber	Duke Energy
Bryan Jacob	Southern Alliance for Clean Energy
Daniel Kassis	Dominion
Evan D. Lawrence	NC Public Staff
Robert Lawyer	ORS
Kate Lee	Southern Environmental Law Center
Shannon Listebarger	Duke Energy
Benjamin P. Lozier	NC Public Staff
Jay Lucas	NC Public Staff
Nadia Luhr	NC Public Staff
Jason Martin	Duke Energy
Lyndsay McNeely	Duke Energy
Carolyn T. Miller	Duke Energy
O'Neil Morgan	ORS
David Neal	Southern Environmental Law Center
Justin Orkney	Duke Energy
Lisa Perry	Walmart
Jenny Pittman	ORS
Gretchen Pool	ORS
Marcus Preston	Duke Energy

Cole	Price	Central Electric Power Cooperative
John	Rafferty	Dominion Energy
Shelley	Robbins	Upstate Forever
Allen	Rooks	Dominion Energy
John	Ruoff	The Ruoff Group
Scott	Saillor	NC Public Staff
Ben	Smith	NC Sustainable Energy Association
Heather Shirley	Smith	Duke Energy
Kim	Smith	Duke Energy
Mike	Smith	Santee Cooper
Bryan	Stone	Lockhart Power
Mark	Svrcek	Central Electric Power Cooperative
Jeffrey T.	Thomas	Duke Energy
Ryder	Thompson	ORS
Neal	Williams	Lockhart Power
David M.	Williamson	NC Public Staff
Tommy C.	Williamson	NC Public Staff
Bruce	Wood	Sunstore
Chip	Wood	Navigant